

Meridian Mail

ETAS Utilities

Publication number:	555-7001-260
Product release:	12
Document release:	Standard 1.0
Date:	January 1998

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Publication history

January 1997

This manual is released as Standard 1.0 for Meridian Mail, Product release 12. In this release, updates were made to the ad_util, om_util, md_dr, md_ma, ulma, md_cm, and md_mt utilities.

November 1996

This manual is released as Standard for Meridian Mail, Product release 11. In this release, updates were made to the ad_util, burp, se_util, ci, om_util, and md_dr utilities. The cptd_util, vx_pkg, diag_util, ulma, sc_serchange, sc_featpkg, sc_flexpkg, ecs_util, and change ETAS/RSC/Admin password utilities were added. In addition, Appendix B was added to document the rebuilding of system files.

August 1995

This manual is released as Standard 1.0 for Meridian Mail 10.0. Operational Measurements data on various reports has been expanded.

June 1994

Manual released as Standard 1.1. Four new utilities have been included (gti_util, has_driver, med_pkg, and c25util) and Appendix A was rewritten.

March 1994

Manual released as Standard 1.0. This version documents Release 9.0 Meridian Mail (ETAS-level Utilities).

April 1993

Manual released as Standard. This version documents Release 8.0 Meridian Mail (ETAS-level Utilities).

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About this guide

Typographic conventions

The following conventions are used throughout this guide:

- **Softkeys** These are displayed on the various administration menus and indicate which keyboard function keys carry out specific Meridian Mail tasks. These are referred to in the document by using the label of the softkey (as displayed in the given menu), delimited by square brackets. For example, [Exit], [OK to Delete].
- **Keyboard keys** These are referred to by indicating the label of the key, delimited by angle brackets. For example, <1>, <2>, <Return>.
- **Key combinations** These are shown as keyboard keys separated by a short dash. For example, <Ctrl>-<m> means hold down the <Ctrl> key, press <m>, and release both keys.
- **Text input** Where you are required to input specific text, the characters are presented in bold print. For example, **abcd** (as opposed to <a><c><d>).
- **Fields on a screen** When the name of a field is referred to, it is in italics and in a different typeface than the body of the document. For example, *Last Name*, *Invalid Logon Attempts*.
- **Screen text** When a sample screen output is shown in the text, the screen typeface is used. For example:

```
disk pair 0
boot region:      32-2031
file region:2032-665153
disk 0: RW
disk 2: RW
```

The following typeface may also be used to represent screen text or prompts where necessary to improve the presentation of the material. For example:

Specify User Mailbox (Blank for all):
Network Billing Start: 00/00/00 00:00:00
Network Billing End: 00/00/00 00:00:00
Mailbox Number:
Department Number:
Recipient Siteld:
Message Priority:

- **Values in Fields** Where a field displays a set of values from which you must select, these values are in quotes. For example, “Yes,” “No,” “Enable,” “Disable.”
- **Spoken words** Where you are required to speak into the telephone, such as in the recording of greetings and announcements, any suggested words appear in quoted italics. For example, Say “*Please wait on the line, an attendant will be with you shortly.*”

References

In this manual, where reference is made to another part of the manual, or to another document, the following conventions are used:

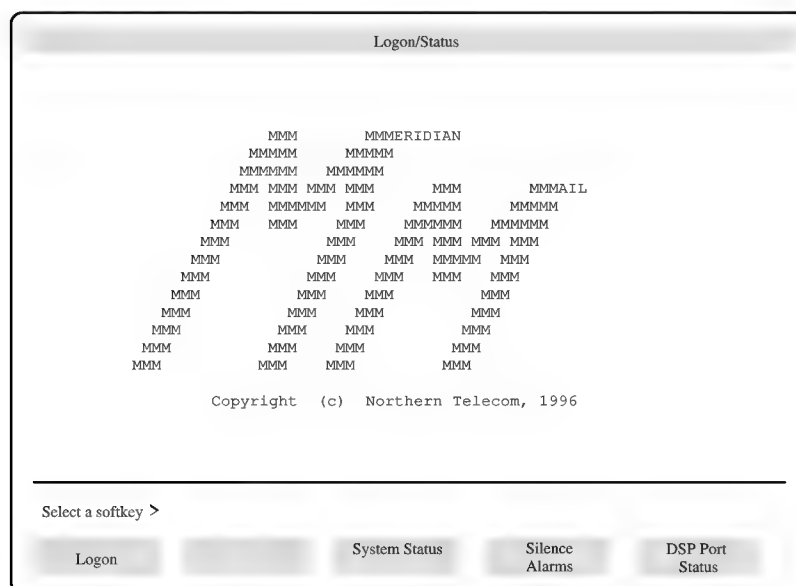
- A reference to text in the same chapter appears surrounded by double quotation marks, giving the heading under which the required text is found. For example, see “Voice recordings” in this chapter.
- A reference to text in another section appears with double quotation marks, giving the name of the chapter and, where necessary, the heading under which the required text is found. For example, see “Voice recordings” in the “User Administration” chapter.
- A reference to text in another manual appears in italics, giving the title of the manual in which the required text is found, along with any applicable reference number. For example, see *Meridian Mail Modular Option EC Installation and Maintenance Guide* (NTP 555-7061-250).

Chapter 1: Introduction

The Logon screen

The Logon screen (Figure 1-1) appears when the administrative console is idle.

Figure 1-1
The Logon screen



To log on to the system and gain access to ETAS utilities, use Procedure 1-1, described on the following page.

Procedure 1-1
Logging on

Starting point: Logon screen

- 1 Press [Logon].
- 2 Enter the ETAS password and press <Return>.
You are prompted to enter the administrator password.
- 3 Enter the Administrator password and press <Return>.
The ETAS screen appears. See the next section, "The ETAS menu," for details.
If an invalid password is entered, an error message appears; try logging on again.

The ETAS level menu

The ETAS level menu appears after a successful logon. The menu is a routing menu from which you can select the utility you want. Never leave the administrative console unattended while you are logged on.

Figure 1-2
The ETAS menu

Special Tools Package ETAS Level Access	
1	Change password
2	ad_util
3	burp
4	om_util
5	se_util
6	md
7	ci
8	md_dr
9	md_ma
10	prm_control
11	vsmup
12	cptd_util
13	vx_pkg
14	diag_util
15	ulma
16	Other

Select an item >

Logoff Redraw Help Release Version

When you select option 16, “Other,” the following menu is displayed.

Figure 1-3
The ETAS menu (continuation)

Special Tools Package ETAS Level Access		
1	rsm_utils	- RSM Maintenance Utility
2	scsi_util	- SCSI Utility (Disk/Tape)
3	md_cm	- MISA Cabinet Utility
4	md_mt	- Message Transfer Utility
5	is_patch	- Database Synch Utility
6	vsp_util	- Voice Services Utility
7	disk_sync	- Disk Shadowing Maintenance *
8	ocs_util	- Outcalling Server Utility **
9	nethost	- Network Debugger *
10	sc_featpkg	- Enable Installed Features *
11	sc_serchange	- Change Serial Number
12	sc_flexpkg	- Online Storage Expansion *

Select an item >

EXIT

* These tools are not available on all hardware platforms and, therefore, may not appear on your screen.

** Only appears on systems with outcalling.

Note 1: The disksync utility is not available on Card Option systems (because disk shadowing is not available on these systems).

Note 2: The nethost utility is not available on single-node systems.

Note 3: Enable Installed Features and Online Storage Expansion are only available on MSM systems.

Note 4: The Change Serial Number Utility is not available on Card Option systems.

Procedure 1-2 **Navigating the ETAS menu**

Starting point: The ETAS menu

- 1 Choose an item by entering its number and pressing <Return>.

The softkeys, if selected, perform the following actions:

[Logoff]	returns you to the Logon screen
[Redraw]	refreshes the menu screen

[Help]	presents general information
[Release Version]	provides a brief summary of any pertinent release information; if the screen is simply redrawn then there is no release information available.

For the other selections, a few moments after you make your selection the menu is redrawn and the program you selected starts executing in another virtual window (not visible from the menu window). See Procedure 1-3 to activate the virtual window.

See the relevant chapter for information about the utility you want to run.

Procedure 1-3 Using the Cobra control and virtual window

- 1 Type <Ctrl>—<W> to activate the Cobra control window.
The Cobra control window lists the virtual windows which are available.
- 2 Use the cursor keys to position the cursor beside the utility's name and type **s** (or press <Return>) to select that window.
Note: You must terminate one application before starting another.

Procedure 1-4 Quitting the virtual window

- 1 When you have finished using the utility, terminate the program in the appropriate manner. Some of the methods include
 - Using the [Exit] softkey.
 - Pressing <Return> (with no data entered).
 - Typing **Quit**.

Note: Terminating the program does not always return you to the ETAS level menu. Follow the remaining steps to return to the ETAS level menu.
- 2 Press <Ctrl>—<W> to return to the list of virtual windows.
- 3 Type **r** beside the name of the utility to remove that window.
- 4 Type **y** to confirm that you want the utility removed.
An asterisk will appear beside the item indicating that it has been removed. The item will not be removed until the menu is refreshed.

- 5 To log off, press the [Logoff] softkey.
The logon screen is redisplayed.

Rebooting the system

Two “soft reboot” methods are available to reboot the system without turning the power off and on (the usual method for rebooting the system).

You are recommended, however, to power off and then power on the system.

Method 1

If a debugger is present on the system, then type `^B^T^B` (where `^B` means pressing the Control key and the letter key at the same time). The system should respond with a “>>” prompt. Enter “KILL 2” at the “>>” prompt and the system should reboot.

Method 2

Whether or not a debugger is present on the system, the following control sequence will reboot the system: `^B^T^B`, followed by `^K^I^L`. Note that if you use this method, you have only 3 seconds to complete the `^B^T^B` sequence. After you complete the `^B^T^B` sequence, you have only 3 seconds to complete the `^K^I^L` sequence. Also, with noisy modem connections, garbage characters can interfere with a control sequence making it invalid. If this happens, try entering the sequence again.

Chapter 2: Change ETAS/RSC/Admin password

Procedure 2-1 Changing the ETAS/RSC/Admin passwords

Starting point: The ETAS menu

- 1 Select Change password.

The Change password screen appears.

You are prompted to enter the level of password to be changed. You can scroll through your choices using the up and down arrow keys.

- 2 Select the level of password you want to change.
- 3 Enter the existing password.
- 4 Enter the new password.
- 5 Reenter the new password to confirm the change.

A message appears confirming that the password has been changed.

Note: If, at any time, an incorrect password is entered, a message will appear informing you that the change was not successful.

- 6 Press <Return> to return to the ETAS menu.

2-2 Change ETAS/RSC/Admin password

Chapter 3: Administration Utility (ad_util)

The Administration utility (AD_UTIL) allows you to access and modify both personal and organization (system and customer) profiles. The regular system administration facility should always be used to add, modify, and delete users. However, if necessary, this utility can be used to modify and delete local voice messaging users (including NMS users) if you are unable to do so through the system administration interface.

Unlike the regular system administration facility, some knowledge of the system's file structure is necessary in order to use some of the commands in AD_UTIL.

**CAUTION****Risk of system corruption**

Some of the commands in AD_UTIL allow you to override restrictions imposed by the system administration facility, which may affect system performance.

Procedure 3-1
Accessing ad_util

Starting point: The ETAS menu

- 1 Select ad_util.
- 2 Press <Ctrl> <w> at the same time to see the virtual window.
- 3 Move the cursor to the ad_util item.
- 4 Press <Return>.

The ad_util screen appears.

Notation

When referring to the command syntax examples, use the following examples as a guide.

<code><xxx></code>	means users substitute their own text, and the parameter is required
<code><xxx> <yyy></code>	means one out of the group must be entered
<code>[<xxx>]</code>	mean the users substitutes their own text, and the parameter is optional
<code>"xxx"</code>	means the text must be entered as shown

System profile versus Customer profile

On each system, there is always only one system profile. For each customer defined on the system, one customer profile exists. Most of the data records that exist in the system profile also exist in the customer profile, and vice versa.

In each record there are various data fields. Some of these data fields are "system-related" while the rest are "customer-related" data fields. In the system profile, only the system-related data fields contain valid values; all other field values are considered meaningless. In the customer profile, only the customer-related data fields contain valid data; all other field values are considered meaningless. Furthermore, some records exist only in the system profile, while other records exist only in the customer profile.

When using the commands OPVIEW and OPMOD (described later in this chapter), you have the choice of retrieving the data from either the system profile, the specified customer profile, or from both the system and the specified customer profile. If the last option is specified, then a combined view of the profiles will be presented to you (that is, all system-related fields in a record will get their values from the system profile, while all customer-related fields in the same record will get their values from the specified customer profile). This is how the regular system administration facility usually retrieves the data.

However, some fields in the profiles are relevant to both the system and the customer profiles. In these cases, when a combined retrieval is performed, the values for those fields are taken from the customer profile. A good example of this is the feature array. In the system profile, only features installed on the system are stored in that array. In the customer profile, only

features accessible to the customer are stored in that array. When a combined view is requested, the value for the array is retrieved from the customer profile (that is, system features not accessible to the customer will not be displayed), as the basic layer assumes you are retrieving data from the point of view of the specified customer. Otherwise, you would have specified only the system profile.

If you specified that you wanted to retrieve data strictly from the system profile, keep in mind that some of the data you are viewing is meaningless. This is also true if you have specified to only retrieve data from the specified customer profile.

Parameters

The commands in AD_UTIL require parameters. AD_UTIL will prompt you if you fail to supply a parameter upon entering a command.

If the parameter has a default value, that value appears as part of the prompt. Press <Return> to enter the default value or backspace over the value to enter a new one. If a default value is not displayed with the prompt, then a value must be specified.

Type **help** at any time to see a list of the available commands. Type **help *command*** (where *command* is a command name) to access information on a specific command.

Organization profile commands

The following commands allow you to manipulate the organization profiles.

OPView <AccessType> [<CustNum>]

OPView is used to view organization (system and/or customer) profiles, allowing you to view each profile record separately. It prompts you for the type of file access you want to perform. The available types are:

- combined
- system_only
- customer_only

Depending upon the file access type, the view of the profile(s) will differ. See the introduction to this chapter for an explanation of the differences between the different types of file access. You will be prompted for the

3-4 Administration Utility (ad_util)

customer number, unless you specified “system_only” as the access type. Enter the customer number of the customer that you want to view.

After entering all of the required parameters, the following prompt is displayed:

PROMPT: Basic? (Quit, N, P, <record>, <cr>) Yes

OPView prompts the user to view the record at which OPView is currently positioned. You can scroll through the various records within the profile by entering **N** to go to the next record, and **P** to go to the previous record. You can also go to a specific record by entering its name.

To list all of the options for this prompt, enter **?**. To view the specified record, enter **Yes** (followed by <Return>). After viewing a record, you are prompted to view the next record (identified by the system). To quit OPView, enter **Q**.

OPMod <AccessType> [<CustNum>]

OPMod is used to modify organization (system and/or customer) profiles, allowing you to modify each profile record separately. It prompts you for the type of file access you want to perform. The available values are:

- combined
- system_only
- customer_only

Depending upon the file access type, the view of the profile(s) will differ. See the introduction to this chapter for more information. You will be prompted for the customer number, unless you specified the access type of system_only. Enter the customer number of the customer you want to modify. After entering all of the required parameters, the following prompt is displayed:

PROMPT: Basic? (Abort, Write, N, P, <record>, <cr>) Yes

OPMod prompts the user to modify the record at which OPMod is currently positioned. You can scroll through the various records within the profile by entering **N** to go to the next record, and **P** to go to the previous record. You can also go to a specific record by entering its name.

To list all the options to this prompt, enter **?**. To view the specified record, enter **Yes** (followed by <Return>). Each field in the record can then be line-edited. Edited fields are validated to ensure that valid data was entered.

If you enter invalid data, the change is not made to the field. Once a record is completely edited, you are prompted to proceed with the next record (identified by the system).

To save the changes made to the profile(s), enter **write** at the next prompt. This saves the changes made to ALL records, not just the current record. It also exits OPMOD. To abort the changes and quit OPMOD, enter **abort**. This cancels ALL changes made, and exits OPMOD.

Sometimes you are prompted to enter a series of related string fields in OPMOD. If you only want to modify one field in the entire series and it is at the start of the series, you could modify it and then press <Return> for all other fields until the end is reached. However, this method is time consuming. A shortcut is to enter the value for the field of interest, and when prompted for the next field, enter a nil string. This bypasses all the other related fields. Note that a nil string is '' (that is, no space), not ' '. If you are using this shortcut, and you want to erase the content of a string field, enter a <space> in the field, that is, ' '. If you simply erased the field but did not enter a <space>, then the field will retain its original value and your input will be interpreted to mean that all other related string fields should be bypassed.

An example of the above is the switch records in the system profile. There may be multiple switch records in the profile; the number is directly related to the number of switches the system is connected to. For example, there are five switch records and the one that needs to be modified is the second one, which happens to be a ROLM switch record (only the ROLM switch prompts you for the various switch codes). Simply press <Return> for all the fields in the first switch record to bypass them. Modify whatever needs to be changed in the second switch record.

When prompted to enter a code, enter a string if you want to enter a value; a <space> if you want to erase what is currently defined; a <Return> if you want to keep the current value; or a nil string if you want to move on to the next organization record (a nil string exits the modify-switch-record sequence altogether). Note that if you want to move to the next field and the current field contains a nil string, you must enter a <space>. If you simply press <Return>, you will go to the next organization record.

Personal profile commands

The following commands allow you to manipulate a personal profile.

SetCust <CustNum>

SetCust allows you to select the customer that you want to work with. This command is used before using the PPView, PPMoD, and DelUser commands. For example, if there are various customer groups on the system and you want to work with customer group 5, enter **SetCust 5**. From this point on, all users that you access will only be from customer group number 5.

SetLocation <Location Code Prefix>

SetLocation is used to set the default location prefix for viewing or modifying users.

Key “MailBoxNumber” | “UserID” | “ClientID”

Key is used to set the retrieval key for viewing, modifying, or deleting personal profiles. (This key is the first parameter in PPView or PPMoD.) The retrieval key can be set to the MailBoxNumber, UserID, or ClientID. The default is UserID. This key is used in PPMoD, PPView, and DelUser. For example, if the key is set to UserID when the command PPView is entered, it will prompt for the UserID of the user profile to be viewed. It is often useful to retrieve by means of the MailBoxNumber since the box number is typically the user’s extension number.

PPView <MailBoxNumber> | <UserID> | <ClientID>

PPView is used to view the personal profile of a user. It does not allow the profile to be modified. It requires either the user’s UserID, ClientID, or MailBoxNumber to be entered depending on what the retrieval key is set to.

The profile consists of several records which PPView allows you to view separately. Once the user’s profile is retrieved, it displays the following prompt:

PROMPT: Basic? (Quit, N, P, <record>, <cr>) Yes

PPView prompts you to view the record at which PPView is currently positioned. You can scroll through the various records within the profile by entering **N** to go to the next record, and **P** to go to the previous record. You can also go to a specific record by entering the name of the record.

To list all the options to this prompt, enter **?**. To view the record, enter **Yes** <Return>. After a record is viewed, you are prompted to view the next record (identified by the system). To quit PPView, enter **Q**.

PPMod <MailBoxNumber> / <UserID> / <ClientID>

PPMod is used to modify a personal profile. It requires either the user's UserID, ClientID, or MailBoxNumber, depending on what the retrieval key is set to. Once the user's profile is retrieved, it displays the following prompt:

PROMPT: Basic? (Abort, Write, N, P, <record>, <cr>) Yes

PPMod prompts the user to edit the record at which PPMod is currently positioned. You can scroll through the various records within the profile by entering **N** to go to the next record, and **P** to go to the previous record. You can also go to a specific record by entering the name of the record.

To list all of the options to this prompt, enter **?**. To edit the specified record, enter **Yes** and press <Return>. The record can then be line-edited. Edited fields are validated to ensure that valid data is entered. The change to the field is not made if invalid data is entered.

After a record is completely edited, you are prompted with the next record (identified by the system). To save the changes made to the record, enter **write**. This saves the changes made to ALL records so far and exits PPMod. To abort the changes and quit PPMod, enter **abort**. This cancels all changes made and exits PPMod.

DelUser <MailBoxNumber> / <UserID> / <ClientID>

DelUser is used to delete a Local Voice Only User, and requires you to enter the user's MailBoxNumber, UserID, or ClientID, depending on what the key is set to. It deletes the user from the corporate/organization directory, and deletes the user's personal cabinet.

Class of Service Support

AD_UTIL provides support for Class of Service (COS). To use the commands in AD_UTIL for COS administration, it is necessary to have some understanding of the implementation of COS in the system.

When a COS is defined in the system, two events occur. First, a COS record is created and stored in the system profile. Secondly, a corresponding index entry in the Corporate Directory is created. This index

entry is used by applications in the system to quickly find out information on a particular COS definition, such as its interface type.

Unlike the regular system administration facility, when a new COS definition is created by AD_UTIL, it always inherits the default values. To set it up differently, another command must be invoked afterwards to modify its definition.

Note: Also unlike the regular system administration facility, AD_UTIL allows COS records to be defined in customer profiles as well as in the system profile. However, always define COS records in the system profile because no current applications can access COS records that are defined in the customer profiles.

AddUCOS <CustNum> <COSNum> <COSName> <Interface>

AddUCOS is used to define a COS in the system. All parameters must be supplied, and their meanings are given below:

<CustNum>

This parameter determines where the new COS record will be stored. Always specify "0". Number 0 indicates the profile of Customer 0, which is the system profile. To supply any other value (as long as the specified customer exists) would cause the COS record to be created in the specified customer's profile and no applications would be able to access it. The newly created COS would be useless on the system.

<COSNum>

The number of the COS to be defined. In a single-customer system, this value has to be between 1 and 15, inclusive. In a multi-customer system, this value can be between 1 and 127, inclusive. In both cases, the supplied COS number cannot already exist in the system.

<COSName>

The name of the COS to be defined. You can specify up to 41 characters.

<Interface>

The interface type. Pick either MMUI or VMUIF. Note that a COS that is defined to be for the MMUI cannot be used by users and customers who use VMUIF, and vice-versa.

Note: All COS numbers in the system must be unique. It is not possible to define a COS #3 for the MMUI interface and a COS #3 for the VMUIF interface. Also, when defining a COS, it is not necessary to

create them in numerical order. For example, you could create COS 5, 9, 3, and 1 in that order.

ViewUCOS <CustNum> <COSNum>

ViewUCOS is used to view a previously defined COS in the system. All parameters must be supplied, and their meanings are given below:

<CustNum>

This parameter determines where the COS record will be retrieved from. Always specify "0". Number 0 indicates the profile of Customer 0, which is the system profile. This is where all COSs should have been stored when adding COSs.

<COSNum>

The number of the COS to be viewed. In a single-customer system, this value has to be between 1 and 15, inclusive. In a multi-customer system, this value can be between 1 and 127, inclusive.

ModUCOS <CustNum> <COSNum>

ModUCOS is used to modify a previously defined COS in the system. All parameters must be supplied, and their meanings are given below:

<CustNum>

This parameter determines where the COS record will be retrieved from for update. Always specify "0". Number 0 indicates the profile of Customer 0, which is the system profile. This is where all COSs should have been stored when adding COSs.

<COSNum>

The number of the COS to be modified. In a single-customer system, this value has to be between 1 and 15, inclusive. In a multi-customer system, this value can be between 1 and 127, inclusive.

Note: When creating a COS using AD_UTIL, it is necessary to invoke the ModUCOS command after AddUCOS to customize each COS definition. After modifying the various fields in the record, the user will be prompted to commit all changes. A reply of "yes" will commit all changes. A reply of "no" will cancel all changes.

DelUCOS <CustNum> <COSNum>

DelUCOS is used to delete a previously defined COS in the system. All parameters must be supplied, and their meanings are given below:

<CustNum>

This parameter determines where the COS record to be deleted is currently stored. Always specify "0". Number 0 indicates the profile of Customer 0, which is the system profile. This is where all COSs should have been stored when adding COSs.

<COSNum>

The number of the COS to be deleted. In a single-customer system, this value has to be between 1 and 15, inclusive. In a multi-customer system, this value can be between 1 and 127, inclusive.

ListUCOS <CustNum> "All" <Sort>

ListUCOS <CustNum> "Interface_Type" <Interface> <Sort>

ListUCOS <CustNum> "COSNum" <COSNum>

ListUCOS <CustNum> "COSName" <COSName>

ListUCOS is used to list all the COSs defined on the system, based on a particular retrieval pattern. When this command is invoked, the information comes from the Corporate Directory, not from the system profile (as is the case with all other COS commands). Thus, it is possible to use this command along with the ViewUCOS command to check the consistency of the COS system. For example, you can verify that for every COS record that exists in the system, a corresponding COS index entry exists in the Corporate Directory.

As shown by the command syntax, there are four possible retrieval patterns possible. The first syntax retrieves all the COS definitions, and displays the data in the specified sort order. The second syntax retrieves all the COSs of the specified interface type, and displays the data in the specified sort order. The third syntax allows for the retrieval of a single COS index entry based on the COS number. The fourth syntax allows for the retrieval of a single COS index entry based on the COS name.

Whichever syntax is used, all parameters must be supplied. The meaning of each parameter is described below:

<CustNum>

This parameter determines where the COS record is stored. Always specify "0". Number 0 indicates the profile of Customer 0, which is the system profile. This is where all COSs should have been stored when adding COSs.

<Sort>

The two possible choices are “Number” and “Name”. If “Number” is selected, the retrieved COS records will be displayed in numerical order based on the COS number. If “Name” is selected, the retrieved COS records will be displayed in alphabetical order based on the COS name.

<COSNum>

The number of the COS to be retrieved. In a single-customer system, this value has to be between 1 and 15, inclusive. In a multi-customer system, this value can be between 1 and 127, inclusive.

<COSName>

The name of the COS to be retrieved. You can specify up to 41 characters.

<Interface>

The interface type. Pick either MMUI or VMUIF. Only the COSs of the specified interface type will be retrieved.

Organization profile fields

The organization profile is made up of records containing a number of fields, many of which can be modified. Not all of the fields and records listed below will appear on your system, as many are feature-dependent. Below is a list of all possible fields.

Note: Using this utility, remote notification targets, custom revert DNs, and DNU dialing codes can be defined to include the pause (*) character.

Basic record

Profile version number	Meridian Mail release number (view only)
System (Meridian 1) number	Meridian 1 customer number (Integer range 0–32767)
System name	Name of system, not the customer name (up to 30 characters)
Date format	mm/dd/yy OR yy/mm/dd OR dd/mm/yy

Feature record

Voice Messaging	In modify mode, the choice “Yes/No” appears; otherwise, view only
Meridian Mail Networking	Only one customer per system can have this feature
Voice Menus and Announcements	In modify mode, the choice “Yes/No” appears; otherwise, view only
Meridian Mail AutoAdmin	(view only)
Dual Language Prompting	(view only)
Multi-Customer	(view only)
Disk to Disk Backup	(view only)
Hospitality	Only one customer per system can have this feature
SMDI	(view only)
Outcalling	(view only)
Network Message Services	In modify mode, the choice “Yes/No” appears; otherwise, read only; only applicable to single-customer systems

AMIS	(view only)
AdminPlus	(view only)
Meridian ACCESS	(view only)
Multiple Administration Terminals	(view only)
Voice Forms	In modify mode, the choice "Yes/No" appears; otherwise, read only
Integrated Mailbox Administration	(view only)
VMUIF Customers	(view only)
Fax On Demand	In modify mode, the choice "Yes/No" appears; otherwise, read only
The user classes are defined by:	In modify mode, the choice "System/Customer" appears; otherwise, read only; for MM9, always select system
Select class for COS array element #:	(15 fields) "None" or 1–127 (modify); "No_Class_Defined" or 1–127 (view)

Telephony record

Customer attendant DN	Customer attendant DN if revert DN fails (up to 30 digits)
Customer Broadcast mailbox	To allow system administrator to broadcast a message to all Voice Messaging users (up to 18 digits)
Play the message length for messages greater than (min)	Length of message warning issued for messages longer than this value (Integer range 0–32767)
Time between messages in autoplay mode (0.1 sec)	(Integer range 0–32767)
Disregard voice messages shorter than (0.1 sec)	Minimum length of a call answering message (Integer range 0–32767)
Delayed prompts will play after (0.1 sec)	Time allowed before delayed prompt is given; 0 => infinite delay (Integer range 0–32767)
Timeout waiting for the next digit (0.1 sec)	Time allowed between digit entry (Integer range 0–32767)
Timeout waiting for the user to log in (0.1 sec)	Time for Voice Messaging to wait before it assumes the user will not log in (Integer range 0–32767)

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Timeout waiting for the user to come back from call sender (min)	To disconnect Voice Messaging during call sender state (Integer range 0–32767)
Timeout waiting to disconnect an idle login session (sec)	To disconnect idle logon session during command input states, and not during recording states (Integer range 0–32767)
Timeout waiting to disconnect an idle call answering session (sec)	To disconnect idle call answering session during command input states, and not during recording states (Integer range 0–32767)
Number of rings to wait before returning from placing a call	Used with the time between rings to compute the time for the service to wait before it assumes no answer. (Integer range 0–15)
Amount of time between two consecutive rings (sec)	Length of time between rings (Integer range 0–32767)
Block CA to a box when overfilled by this: (X * mailbox size; 0 => no effect)	Call answering message blocking factor. (Integer range 0–20) e.g., If X is 2, then twice the mailbox size. CA messages will not be accepted once mailbox exceeds this size.
Voice Messaging Interface	Meridian Mail Standard/VMUIF (view only)
The length of DN's for this customer group	Length of DN at a customer group (Integer range 0–30)
The precode for thru-dial to a user of the same customer group	Code prefixed to a DN when a user is calling someone within the same customer group via thru-dial from Voice Messaging.
Address expansion for local DN of the length (1st entry)	Length of the local DN with respect to the customer. Used to determine whether address expansion is required. (Integer range 0–32767)
Address expansion for local DN of the length (2nd entry)	Length of the local DN with respect to the customer. Used to determine whether address expansion is required. (Integer range 0–32767)
Expand mailbox/DN to this length	The length of the mailbox/Network DN to be used for address expansion. (Integer range 0–255)
Multi-SPM customer group	Yes/No If No, all users of the customer group are contained within one SPM.
Length of time the ANI will wait before timing out (.01 sec)	The range is 0–32767. The default is 0. (It is 50 in Russia).

Supervised Transfer Delay (.01 sec)	The range is 100–1000 centicall (.01 sec) seconds. The default is 200.
Voice message playback speed % increase for speed 0:	None. This value cannot be changed.
Number of segments to play and drop for speed 0:	0–0. This value cannot be changed.
Voice message playback speed % increase for speed 1:	The default is 33. Possible speed increments are 25%, 33%, 50%, 67%, 75%, and 100%. None is valid.
Number of segments to play and drop for speed 1:	The default is 3–1 (play 3, drop 1; corresponds to a 33% increase in speed).
Voice message playback speed % increase for speed 2:	The default is 67. Possible speed increments are 25%, 33%, 50%, 67%, 75%, and 100%. None is valid.
Number of segments to play and drop for speed 2:	The default is 3–2 (play 3, drop 2; corresponds to a 67% increase in speed).
Voice message playback speed % increase for speed 3:	The default is 100. Possible speed increments are 25%, 33%, 50%, 67%, 75%, and 100%. None is valid.
Number of segments to play and drop for speed 3:	The default is 1–1 (play 1, drop 1; corresponds to a 100% increase in speed).

Login record

Default Language	Default Voice Messaging language for the customer group
Secondary Language	Secondary Voice Messaging language for the customer group. Only if Dual Language prompting is enabled.
Terminate session after this number of unsuccessful logon attempts	Number of times during a single session a user can attempt to login before the session is disconnected (Integer range 1–99)
Disable logons after this number of unsuccessful logon attempts	Number of invalid passwords allowed before disabling user logins (Integer range 0–99)
System debug level	Level at which diagnostics are running (Integer range 0–255)
Block Meridian Mail on catastrophic disk failure	Yes/No

3-16 Administration Utility (ad_util)

End to End Answer Supervision	Available/Unavailable Available => rely on call progress information																								
Region Id	Standard/France Standard => Standard RN/DNU defaults will be used. France => France RN/DNU defaults will be used. The France defaults are: <table><tr><td>RN Busy Retry Limit</td><td>1</td></tr><tr><td>RN No Answer Retry Limit</td><td>4</td></tr><tr><td>RN Answer Retry Limit</td><td>0</td></tr></table> <table><tr><td>DNU Busy Retry Limit</td><td>1</td></tr><tr><td>DNU No Answer Retry Limit</td><td>4</td></tr><tr><td>DNU Answer Retry Limit</td><td>0</td></tr></table> <table><tr><td>RN Busy Retry Interval</td><td>00:05</td></tr><tr><td>RN No Answer Retry Interval</td><td>00:05</td></tr><tr><td>RN Answer Retry Interval</td><td>00:05</td></tr></table> <table><tr><td>DNU Busy Retry Interval</td><td>00:05</td></tr><tr><td>DNU No Answer Retry Interval</td><td>00:05</td></tr><tr><td>DNU Answer Retry Interval</td><td>00:05</td></tr></table> Note: If the Region ID field is changed after the creation of customer groups, previously created customer groups will maintain their previous values. New Customers created after this field has been changed will have either the "Standard" or "France" outcalling defaults depending on the Region ID setting.	RN Busy Retry Limit	1	RN No Answer Retry Limit	4	RN Answer Retry Limit	0	DNU Busy Retry Limit	1	DNU No Answer Retry Limit	4	DNU Answer Retry Limit	0	RN Busy Retry Interval	00:05	RN No Answer Retry Interval	00:05	RN Answer Retry Interval	00:05	DNU Busy Retry Interval	00:05	DNU No Answer Retry Interval	00:05	DNU Answer Retry Interval	00:05
RN Busy Retry Limit	1																								
RN No Answer Retry Limit	4																								
RN Answer Retry Limit	0																								
DNU Busy Retry Limit	1																								
DNU No Answer Retry Limit	4																								
DNU Answer Retry Limit	0																								
RN Busy Retry Interval	00:05																								
RN No Answer Retry Interval	00:05																								
RN Answer Retry Interval	00:05																								
DNU Busy Retry Interval	00:05																								
DNU No Answer Retry Interval	00:05																								
DNU Answer Retry Interval	00:05																								
Password Display Suppression Enabled:	Yes/No. The default is No.																								
Block help prompts during external sessions:	Yes/No. The default is No.																								
Force password change for initial user login:	Yes/No. The default is Yes.																								
Threshold % above which disk storage warnings should be issued	(Integer range 1–100)																								
Threshold % above which mailbox storage warnings should be issued (0 => no warning)	(Integer range 0–100)																								
Override preferred language (call answering, express messaging)	Yes/No Yes => Default Language will override all user's preferred languages.																								
Default Password Prefix:																									
Number of days the current text logon password is valid (0=>N/A) days:	The default is 0.																								

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Number of days the current voice logon password is valid (0=>N/A) days:	The default is 30.
Number of days before the voice password expires, for warning (days):	The default is 5.
Number of unique voice passwords required before re-use:	The default is 5.
Number of unique text passwords required before re-use:	The default is 5.
Minimum length of the voice password:	The default is 4. (Integer range 0–32767)
Minimum length of the text password:	The default is 4. (Integer range 0–32767)
Minimum length of admin passwords:	The default is 6. (Integer range 0–32767)
Allow duplicate user DNs	Yes/No. The default is No.
Introduction tutorial	None/Default/Custom Type of tutorial to play to a VMUIF user the first time the user logs in; also indicates which language the tutorial will use (there is one introduction tutorial for each of the installed languages); only applicable to VMUIF users
Login Greeting	None/Default/Custom Type of prompt to play when a user logs into the system; also indicates which language the greeting will be in (there is one login greeting for each of the installed languages); only applicable to VMUIF users
DP Introduction tutorial	None/Default/Custom Type of tutorial to play to a VMUIF user who uses a dial pulse telset the first time the user logs in; also indicates which language the tutorial will use (there is one DP introduction tutorial for each of the installed languages); only applicable to VMUIF users
VMUIF user lockout revert DN	Call revert DN when user locked out due to too many invalid login attempts; up to 30 digits
Default Password Prefix	Prefix for default password; up to 4 digits
Number of days the current text logon password is valid (0=> n/a) (days)	(Integer range 0–32767; 0 => infinite)
Number of days the current voice logon password is valid (0=> n/a) (days)	(Integer range 0–32767; 0 => infinite)
Number of days before the voice password expires, for warning (days)	(Integer range 0–60)

3-18 Administration Utility (ad_util)

Number of unique voice passwords required before re-use	(Integer range 0–32767)
Number of unique text passwords required before re-use	(Integer range 0–32767)
Minimum length of the voice password	(Integer range 0–32767)
Minimum length of the text password	(Integer range 0–32767)
Logons from a telephone external to the system	Enabled/Disabled (Note: Once logons external to the switch are disabled and the record is written to the organization profile, external logons can never be re-enabled)
Name dialing/addressing enabled	Yes/No To enable name dialing/addressing through Voice Messaging and Extension Dialing
Name dialing/addressing prefix	Up to two digits

OM (Operational Measurements) file limits

Next collection date (dd/mm/yy)	Collection date in specified format
Collect start (hh:mm:ss)	Collection start time in specified format
Maximum billing periods	Number of billing periods to keep on disk (Integer range 1–63)
Maximum number of traffic files	Number of days worth of data for Local and Network traffic files (Integer range 0–32767)
Maximum number of billing files	Number of days worth of data for billing files (Integer range 0–32767)
Bills that cannot be traced to this DN	Calls that cannot be traced to a particular user are charged to this DN; up to 30 digits
Outcalling volume ID	Volume for OCS use (Integer range 1–999)
Threshold % above which audit trail commits will be disabled	Audit Trail disabled at this disk percentage (Integer range 0–100)
Number of days to hold audit trail data (days)	Number of days to hold audit trails (Integer range 1–63)
Collect audit trail data	Yes/No
Print SEERs	Yes/No; to enable SEER printing
SEER printer port name	Up to 12 characters
OM printer port name	Up to 12 characters

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OM Traffic record

Collect and store traffic data	Yes/No; to enable collection of traffic data
Traffic start time (hh:mm:ss)	Start time in specified format
Traffic end time (hh:mm:ss)	End time in specified format
Traffic commit interval (hh:mm:ss)	How often to collect data
Collect and store billing data	Yes/No; to enable collection of Local billing data
First MWI audit start time (hh:mm:ss)	Start time in specified format
Second MWI audit start time (hh:mm:ss)	Start time in specified format

Administration record

System greeting recorded	Language name and Yes/No for each language installed (view only)
Call Sender to Non-Users allowed	Yes/No
Maximum retention for read files (days)	Days ahead that read files will be marked for deletion (Integer range 0–31)
Default network message priority	Economy/Standard Note: Only appears when Meridian Mail Networking is enabled for this customer.
Maximum timed delivery delay (days)	(Integer range 0–365)
Timeout waiting for extension to be entered after “0” revert (0.1 sec)	(Integer range 10–50)
Restriction/permission list for thru-dial in call answering	None/Local/On_Switch/Long_distance_1/Long_distance_2
Total number of customers on the system	Number of customers currently defined on the system. WARNING: only modify to fix system inconsistencies
The customer number of the Networking customer	Number of the customer with Networking capability. WARNING: only modify to fix system inconsistencies
The customer number of the Hospitality customer	Number of the customer with Hospitality capability. WARNING: only modify to fix system inconsistencies

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The customer number of the default ACCESS customer	(Integer range 1–2000)
The default IMA customer number	The number of the customer to which IMA will add users (Integer range 1–2000)
Validation of calling party name in IMA administration	Yes/No Yes => IMA software validates calling party name.
The VMUIF personal distribution list prefix	Prefix used to mark a personal distribution list in VMUIF addressing; up to 2 digits
The VSDN data is sorted by	DN/Customer_Number/Service_Type/Comment
The service definition data is sorted by	DN/Customer_Number/Comment
The choice of services actions is sorted by	Acronym/Service_Name
The choice of menu actions is sorted by	Acronym/Menu_Action_Name
Display choice of services in CAT	Yes/No
Display choice of services in VSDN	Yes/No
Display choice of services in Find form	Yes/No
Display choice of services in Voice Menu	Yes/No
The users community for this customer group	Business/Residential/Hospitality Community that user belongs to (view only)
The default UCOS to use when adding a user from a utility	(Integer range 1–127)
Block the capture of external CLIDs:	Yes/No
The Maximum number of Temporary Remote voice users	For 2 nodes or fewer, the default is 1000. The valid range is 0–1000. For 3 nodes or more, the default is 1000. The valid range is 0–10 000.
Percentage of Maximum number of TRVUs to trigger nightly audit	The default is 75%. The valid range is 0–100%.
Percentage of Maximum number of TRVUs to be left after audit is finished	The default is 50%. The valid range is 0–100%.
Default new Remote Voice Users to be name dialed by external callers:	Yes/No. The default is Yes.
System Access Monitoring Period START time (hh:mm):	The default is 23:00.
System Access Monitoring Period END time (hh:mm):	The default is 05:00.

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Monitor all CLIDs using Thru-dial during monitor period:	Yes/No/Always Monitor. The default is No.
Monitor specific CLIDs in Thru-dial and Mailbox Logins during monitor period:	Yes/No/Always Monitor. The default is No.
Do you wish to view the CLIDs being monitored?	Yes/No. If Yes is selected, displays the Internal CLIDs monitored, followed by the External CLIDs monitored.
Label to be used on ALL backup tapes:	The default is blank.
(List of 15 backup requests) – Volume ID – Target Node – Media	List of volumes for which a backup is currently scheduled (view only) Volume to be backed up Node for write; Used in Disk-to-Disk backup User Profiles Only/The Whole Text Volume/Both Voice and Text Volumes/Unknown
Backup schedule	Current schedule of disk backups (view only)
Backup in progress	Yes/No (view only)
Backup list	List of volume names to be backed up (view only)

VS (Voice Services) Profile record

The Voice Services Profile Version	(view only)
Volume where the voice services are defined	Disk volume where voice services cabinet resides (Integer range 1–32767)
Time when VS Profile record last updated (dd/mm/yy hh:mm:ss)	(view only)
Transfer to OTA upon receiving initial AMIS tone	Yes/No
Issue SEER whenever a Voice Menu or a VSDN entry is modified	Yes/No
The initial timeout (0.01 sec)	Time allowed for completion of commands before action taken by service (Integer range 0–32767)
The second timeout (0.01 sec)	Time before disconnecting or connecting caller to an attendant (Integer range 0–32767)

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Maximum time allowed for silence (sec)	Time voice service remains active while recording silence before disconnect (Integer range 0–32767)
Maximum size of a prompt (sec)	(Integer range 0–32767)
Maximum size of an announcement (sec)	(Integer range 0–32767)
Start of business day (hh:mm)	With next field, defines business hours of customer
Close of business day (hh:mm)	
Number of holidays defined	(view only)
Holiday definition – Holiday start date (dd/mm/yy) – Holiday end date (dd/mm/yy) – Comments	Listed if defined. Up to twenty may be defined. With next field, defines customer's holiday Comments associated with this holiday

Switch Data record

Switch records	One record for each switch on the system
– Switch type	Lists all switches in system (view only)
– Transfer option	Conference/Blind_Transfer/ Half_Blind_Transfer
– Reconnect option	Single_Flash_Hook/Double_Flash_Hook
– Transfer code	Note: only appears if using ROLM switch
– Reconnect code	Note: only appears if using ROLM switch
– Conference code	Note: only appears if using ROLM switch
– Drop conference code	Note: only appears if using ROLM switch

Language record

Language records	One record for each language on system
System defined name	25 character field for customer preferred language name. Used for display.
NT defined name	Northern Telecom predefined language name (read only)
Language ID	(read only)
Prompt order for timed delivery	month followed by day/ day followed by month
Reply to Phone Number prompt cannot be interrupted for this many seconds	The default is 3. The valid range is 0–15 seconds.

Restriction/Permission Codes record

Restriction/Permission Code Sets	The possible code sets are On switch, Local, Long_distance_1, and Long_distance_2. Each restriction or permission code set has up to 10 entries. Each restriction or permission code can be up to 5 digits in length.
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Outcalling record

Default numeric pager call-back data	Up to 8 digits or *'s
Paging service terminator	P.I.N. terminator when calling users of a paging service. One of "#", "e", "" (null-string), or blank. The default is #.
Numeric Pager Data Separator	#, *, and blank. Blank indicates no data separator character is sent. The default is *.
Voice Pager Skip Greeting Character	0–9, #, *, or blank. Blank indicates no skip greeting character is sent. The default is blank.
Voice Pager Notification Length (Seconds)	The maximum length in seconds that a voice page can be played out. The range is 1–6000. The default is 20.
Maximum number of remote notification multiple retry failures	When reached, notification is turned off for the user (Integer range 0–32767)

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Total number of agents that can be used by outcalling server	(Integer range 0–32767)
Outcalling server blocked retry interval (min)	Amount of time to wait before retrying after a failed attempt to acquire an OCA (Integer range 0–60)
Maximum number of retries for delivery to a non-user when busy	(Integer range 0–10)
Retry interval for delivery to a non-user when busy (hh:mm:ss)	Interval time in the specified format
Maximum number of retries for delivery to a non-user when no answer	(Integer range 0–10)
Retry interval for delivery to a non-user when no answer (hh:mm:ss)	Interval time in the specified format
Maximum number of retries for delivery to a non-user when answered	(Integer range 0–10)
Retry interval for delivery to a non-user when answered (hh:mm:ss)	Interval time in the specified format
Start of Monday to Friday regulatory time window (hh:mm:ss)	Start time in the specified format
End of Monday to Friday regulatory time window (hh:mm:ss)	End time in the specified format
Start of Weekend regulatory time window (hh:mm:ss)	Start time in the specified format
End of Weekend regulatory time window (hh:mm:ss)	End time in the specified format
Prefix and Dial Codes Prefix Dial Code	Up to 5 prefix/dial code pairs can exist. Prefix used to reference specified dial code. Up to 5 digits Up to 5 digits
Number of times to play a DNU message	(Integer range 1–2)
DTMF confirmation required before a DNU message is played	Yes/No
Above value overrides user's DTMF confirmation requirement	Yes/No Yes => overrides personal profile
Length of time available to deliver a DNU message (dd:hh:mm:ss)	Beyond this time, DNU message is stale dated and a Non-Delivery Notice will be returned.

Hospitality record

Post checkout audit time for unread messages (hh:mm:ss)	Audit time at which time unread messages will be cleaned out of post checkout mailbox
Post checkout audit cycle for read messages every (hours)	Audit cycle for cleaning out read messages from post checkout mailbox (Integer range 1–23)
Post checkout retention time for unread messages (days)	Length of time unread messages kept in post checkout mailbox (Integer range 0–99)
Post checkout retention time for read messages (hours)	Length of time read messages kept in post checkout mailbox (Integer range 0–23)
PMS protocol	PMS1/PMS2/PMS3
PMS timeout (0.1 sec)	Time in centiseconds (Integer range 0–32767)
PMS inactivity timeout (min)	Time in minutes (Integer range 1–32767)
Asynchronous Voice Count Option	No_Asynch/Any_Change/To_From_Zero How and how often to send asynch counts to PMS
Upon checkout display VC information	Yes/No
For VC information display at	PMS/GAC
Maximum number of NAKs permitted	Maximum number of consecutive NAKs (Integer range 0–32767)
Support CPND	Yes/No Yes => PMS does pass names to MM Hospitality
Maximum length of PMS name	(Integer range 1–27)
Text message center DN	Up to 30 digits
Vacant room revert DN	Up to 30 digits
Revert DN when no voice messaging	Up to 30 digits
Activate Meridian 1 alarm on PMSI link error	Yes/No
Polling messages are not sent to PMS	Yes/No
PMS sends ACK/NAK in response to MM messages	Yes/No
Language ID provided by PMS	Yes/No
Link between MM and PMS exists	Yes/No
Link between MM and Meridian 1 exists	Yes/No

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Language ID Table for PMS messages Language ID: Language Index:	Up to 8 entries in the table Up to two characters Integer range 1–n, where n is the number of languages on the system
PMSI link character mapping table PMSI Char: Internal Chars:	International character mapping table used to map PMSI link characters to international characters. Up to 16 entries in the table. Any character Up to two characters
The default Guest COS	The only Mailbox COS available to Guest users. (Integer range 1–127)
Greeting when no voice messaging	Custom/Default/None (One for each language) Used when VM intentionally turned off by guest
Greeting when room vacant	Custom/Default/None (One for each language)
Greeting when phone unanswered	Greeting when phone not answered Custom/Default/None (One for each language)
Greeting when guest busy	Custom/Default/None (One for each language)
Guest Login Greeting	Voice Messaging login greeting Custom/Default/None (One for each language)
Guest Introduction Greeting	Custom/Default/None (One for each language)
Set MWI for Introduction Greeting	Yes/No (One for each language)
Guest System Greeting recorded	Yes/No (view only) (One for each language)
Text messages exist so	SayNothing/SayGotoTxtCtr/SayGotoTV
Default DN length for rooms	(Integer range 1–7)
DN pad digits	Up to six characters
Password based on	CheckInDate/RoomID/LastName
System generated password length	(Integer range 4–16)

AMIS record

Start of Monday to Friday regulatory time window (hh:mm:ss)	Start time in the specified format
End of Monday to Friday regulatory time window (hh:mm:ss)	End time in the specified format
Start of Weekend regulatory time window (hh:mm:ss)	Start time in the specified format
End of Weekend regulatory time window (hh:mm:ss)	End time in the specified format
Restriction/permission list for AMIS messages	None/On_Switch/Local/Long_distance_1/ Long_distance_2
The AMIS prefix	Used to indicate that following address is for an AMIS recipient. Up to 2 characters.
Able to compose AMIS messages	Yes/No
Able to receive AMIS messages	Yes/No
The public AMIS Access Number	Up to 30 digits or *'s
Number of AMIS messages to send per session	(Integer range 0–9)

Voice Forms record

Volume where Form Definitions files are stored	(Integer range 1–999)
Volume where Group & Form Info files are stored	(Integer range 1–999)
Time to audit responses and do recovery (hh:mm:ss)	Time in the specified format
Average number of channels used for Voice Forms	Number of active channels for voice forms (Integer range 0–32767)
Number of active Voice Forms	Number of concurrently active voice forms (Integer range 0–32767)
Minimum amount of time allowed for an answer (0.1 sec)	(Integer range 1–32767)
Maximum amount of time allowed for an answer (0.1 sec)	(Integer range 1–32767)

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Time before delayed prompt played to caller (0.1 sec)	(Integer range 1–32767)
Time before delayed call played to transcriber (0.1 sec)	(Integer range 1–32767)
Time allowed between digit entry (0.1 sec)	(Integer range 1–32767)
Maximum silence allowed before recording stops (sec)	(Integer range 1–32767)
Time before VFSU assumes transcriber won't login (sec)	(Integer range 1–32767)
Time before disconnecting during call sender (sec)	(Integer range 1–32767)
Time before disconnecting during idle caller session (sec)	(Integer range 1–32767)
Time before disconnecting during idle transcriber session (sec)	(Integer range 1–32767)
Time before assuming caller has rotary phone (0.1 sec)	(Integer range 1–32767)

Font record

Font records	One record exists for each font installed on the system. These records are all view only.
Font Name	Up to 13 characters
Font Weight	Regular/Bold/Italic/Unknown
Font Resolution	Normal/Fine/SuperFine
Font Character Set	TrimTab/ASCII/8859/UniCode
Font Point Size	(Integer range 5–72)
Font Type	Fixed/Proportional/Unknown

Fax record

Line spacing (in terms of the calculated minimum spacing value)	(Integer range 0–1728)
Top Margin (in terms of scan lines)	(Integer range 0–2150)
Bottom Margin (in terms of scan lines)	(Integer range 0–2150)

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Left Margin (number of pixels)	(Integer range 0–1728)
Right Margin (number of pixels)	(Integer range 0–1728)
Tab Width (number of space characters)	(Integer range 0–1728)
The font associated with this FASCII object	(Integer range 0–255)
Resolution of faxes to be transmitted	Normal/Fine/SuperFine
Resolution of faxes to be received	Normal/Fine/SuperFine
Outcalling server (fax) blocked retry interval (min)	If a fax agent cannot be acquired, then wait this amount of time before trying again. (Integer range 0–60)
Total number of fax agents that can be used by outcalling server	(Integer range 0–32767)
Maximum number of fax requests processed at a time (0 = all)	A value of 0 means the channel is not relinquished until all the queued requests have been processed. (Integer range 0–32767)
Maximum number of pages for a single fax item	(Integer range 0–32767)
Amount of time to wait before sending out a carrier tone (sec)	(Integer range 0–255)
Maximum number of retries for fax delivery when no carrier detected	(Integer range 0–10)
Retry interval for fax delivery when no carrier detected (hh:mm:ss)	Interval time in the specified format
Maximum number of retries for fax delivery when transmission fails	(Integer range 0–10)
Retry interval for fax delivery when transmission fails (hh:mm:ss)	Interval time in the specified format
Start of Business Day regulatory time window (hh:mm:ss)	Time in specified format
End of Business Day regulatory time window (hh:mm:ss)	Time in specified format
Start of Non-Business Day regulatory time window (hh:mm:ss)	Time in specified format
End of Non-Business Day regulatory time window (hh:mm:ss)	Time in specified format

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Length of time available to deliver a fax message (dd:hh:mm:ss)	Beyond this time the fax message is stale dated and discarded. For FIS, NDNs will not be issued; for fax distribution, NDNs will be issued
Restriction/permission list for fax messages	None/On_Switch/Local/Long_distance_1/Long_distance_2

Personal profile fields

The personal profile is made up of records accessed by the voice messaging software and other applications. It contains the following records:

- Basic user record
- System record
- Session record
- Text Messaging record
- Voice Messaging record
- Administration record
- Hospitality record
- Remote Notification record

Add User information

Creating a new user via ad_util creates a special User ID with “ZZ” as the first two characters. A sample Add User session:

```
Enter Last Name:      Smith
Enter First Name:     John
Enter Mailbox Number: 2244
Enter DN:             2244
Enter UserID:         ZZSmit2244
Enter COS Number:     Personal_Class
Preferred Language:   English
User <ZZSmit2244> Added
```

Basic record

Profile version number	Meridian Mail Release Number (view only)
Location/Customer ID	Integer range of 0–63; view only; must be non-zero for NMS users
Client ID	Appears as up to 41 characters. Assigned by system on creation of user, and does not change. (view only)
User ID	User identifier, generally composed of user's last name and mailbox number. Up to 13 characters.

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Mailbox number	Up to 18 digits (read only)
User Class	The Mailbox COS number used by this user (Personal_Class or Integer range 1–127)
Customer number	Customer group to which the user belongs (Integer range 1–2000) (view only)
Created by	The component of Meridian Mail that created the user.
Last updated by	The component of Meridian Mail that modified the user.

System record

User cabinet/profile resides on volume	(view only)
Allocated voice storage (8K Blocks)	Total space allocated for voice Integer range 1–2,147,483,647
Voice storage used (8K Blocks)	Space remaining for voice storage (view only)
Allocated text storage (1K Blocks)	Currently not used
Text storage used (1K Blocks)	Currently not used (view only)
Total number of invalid voice logons	(view only)
Total number of invalid text logons	(view only)
User last logged on at (dd/mm/yy hh:mm:ss)	Date and time in the specified format (view only)

Session record

Enabled UCOS features	Any of Dual Language Prompting, Outcalling, and AMIS
Voice logon password	Up to 16 digits (mod only)
Voice logon password last changed (dd/mm/yy hh:mm:ss)	Date and time in the specified format (read only)
Text logon password	Up to 16 characters (mod only)
Text logon password last changed (dd/mm/yy hh:mm:ss)	Date and time in the specified format (read only)
Preferred language	User's preferred language
Administrator	Yes/No

Compose messages to broadcast DN of customer group	Yes/No
Network Broadcast Capability:	Yes/No. The default is No.
Voice Messaging Interface:	Meridian Mail Standard is the default. The options are Meridian Mail Standard and VMUIF.
User has dual language call answering	Yes/No (MMUI only)
User use dial pulse interface	Yes/No (VMUIF only) Yes => User needs dial pulse interface
Voice volume level	Normal/Loud/Louder/Loudest (VMUIF only)
Login from Call Answering	Off/OwnMailbox/CustomerGroup (VMUIF only)
Play originator's address in message headers and envelope	Yes/No (VMUIF only)
Replay message header	Yes/No (VMUIF only)
Receive all Call Answering messages	Yes/No (VMUIF only)
[Amount of time to] lockout mailbox after password violation (hh:mm)	Time in the specified format. Default is 00:00 which means until manually removed by administrator. (VMUIF only)
Time of mailbox lockout [due to password violation] (dd/mm/yy hh:mm:ss)	Time of lockout due to password violation. (read only) (VMUIF only)

Text Messaging record

Accept voice mail (for MTA)	Yes/No
Accept text mail (for MTA)	Yes/No
Number of days to keep unread messages	(Integer range 0–32767)
Name of link that turns on the user's MWI	Up to 19 characters
Notify toolkit server of any incoming messages	Yes/No
Message waiting indication option	Any/Urgent/None
Message waiting indication DN	Up to 30 digits
Notification state of ACCESS Fax messages	Off/On/On_Reset
Number of ACCESS Fax messages	(read only)
Notification state of ACCESS Text messages	Off/On/On_Reset

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Number of ACCESS Text messages	(read only)
Notification state of PMS Text messages	Off/On/On_Reset
Number of PMS Fax messages	(read only); only applicable to Hospitality systems
Retain a copy of a sent message	Yes/No (MMUI only) Yes => Retain copy of message sent No => Tag for deletion upon logoff Only applicable to Hospitality systems
Message status when call disconnected during compose	Send/Delete/Hold (VMUIF only)
Allowed to send messages to users outside customer group/SPM	Yes/No
Allowed to receive messages from users outside customer group/SPM	Yes/No

Voice Messaging record

Play delayed prompts	Yes/No
Play all messages automatically	Yes/No
Bypass prompting for mailbox/password	Yes/No Yes => A call to Voice Messaging from the user's phone automatically logs the user in
Custom revert DN upon pressing "0"	Up to 30 digits or *'s If undefined, System Attendant DN will be called
Personal external greeting recorded	Yes/No (view only)
Personal internal greeting recorded	Yes/No (view only)
Files tagged for deletion will be physically deleted after (days)	(Integer range 0–32767)
Read messages will be retained (0=> system limit) (days)	(Integer range 0–99)
Maximum length for a call answering message (sec)	(Integer range 0–32767)
Maximum length for a compose/send message (sec)	(Integer range 0–32767)
Maximum length of a personal greeting (sec)	(Integer range 0–32767) (VMUIF only)

Call sender capability	Yes/No
Remote notification capability	Yes/No
Delivery to Non-Users capability	Yes/No
Edit schedules, periods, and targets via telset keypad	Enabled/Disabled
Caller gets busy notification when user is on the phone	Yes/No
Call answering sessions have been terminated because mailbox is full	Yes/No (read only)
User can bypass menus and go directly to msgs	Yes/No
User can compose AMIS messages	Yes/No
User can receive AMIS messages	Yes/No
Mailbox has compose/send capability	Yes/No (VMUIF only)
Send message via DNU if mailbox not found	Yes/No
Restriction/permission list for extension dialing from login	None/On_Switch/Local/Long_distance_1/ Long_distance_2
Restriction/permission list for editable operator assistance	None/On_Switch/Local/Long_distance_1/ Long_distance_2
Restriction/permission list for external call sender	None/On_Switch/Local/Long_distance_1/ Long_distance_2
Restriction/permission list for AMIS addressing	None/On_Switch/Local/Long_distance_1/ Long_distance_2

Admin record

Number of submailboxes that can be created	(Integer range 0–8) (VMUIF only)
Submailbox(es) have been created before	Yes/No Yes => User's password must begin with 1 (VMUIF only)
Currently the number of submailboxes is	(read only) (VMUIF only)
Can change own spoken name	Yes/No (MMUI only)
Issue SEER if this mailbox is logged into during monitoring period:	Yes/No. The default is No.

Hospitality record

User class	Staff/Guest
Room status is	Vacant/Occupied/Failure / CheckInWait/CheckOut Wait CheckIn Wait => Check in in progress CheckOut Wait => Check out in progress
VM are accepted by room	Yes => Guest wants Voice Messaging No => Guest wants Voice Messaging
Re-checkin flag has been set	Guest rechecking in after accidental checkout. Yes/No
Guest has changed password	Yes/No
Guest has logged in at least once	Yes/No
Copy has been done for room	Nothing/Messages/Mailbox Description of the type of copying done, if any
Last copied from this mailbox	Mailbox number up to 18 digits
Last time messages copied to room (dd/mm/yy hh:mm:ss)	Date and time in the specified format
Last checkout date for accidental checkouts – The month – The day – The hour – The minute – The sec – The unique value	(Integer range 1–12) (Integer range 1–31) (Integer range 0–23) (Integer range 0–59) (Integer range 0–59) (Integer range 0–254)
The unique room ID for each new check-in	Up to 16 characters
The Cabinet FID	Cabinet File ID (if none, value is NIL) Used as temporary storage for new cabinet FID

Remote Notification record

Request is currently active	Yes/No
Remote notification request submitted (dd/mm/yy hh:mm:ss)	Date and time in the specified format (view only)
RN request should be delivered (dd/mm/yy hh:mm:ss)	Should be or should have been delivered times

Temporary schedule will end midnight of (dd/mm/yy)	Date in the specified format
Maximum number of retries for remote notification when busy	(Integer range 0–10)
Retry interval for remote notification when busy (hh:mm:ss)	Time in the specified format
Maximum number of retries for remote notification when no answer	(Integer range 0–10)
Retry interval for remote notification when no answer (hh:mm:ss)	Date in the specified format
Maximum number of retries for remote notification when answered	(Integer range 0–10)
Retry interval for remote notification when answered (hh:mm:ss)	Time in the specified format
Current number of retries	Current number of retry cycles (read only)
Remote notification state	turned ON/turned OFF/ turned OFF due to retry limit/ turned OFF by external call/ turned OFF due to bad DN
Remote notification priority	Any => Any message will cause RN to commence. Urgent => Only urgent messages will cause RN to commence.
Disabled in schedule	(Integer range 0–2) (view only) 0 => Temporary; 1 => Business; 2 => Non-business
Disabled in time period	(Integer range 0–2) (view only)
Disabled by number	Disabled by DN number (Integer range 0–2) (view only)
Restriction/permission list for remote notification	None/On_Switch/Local/Long_distance_1/ Long_distance_2
Temporary schedule is currently enabled	Yes/No. The default is No.
The number of temporary schedule time periods per day	(Integer range 0–3). The default is 0.
Business days schedule is currently enabled	Yes/No. The default is No.
The number of time periods per business day	(Integer range 0–3). The default is 0.
Non-business days schedule is currently enabled	Yes/No. The default is No.

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The number of time periods per non-business day	(Integer range 0–3). The default is 0.
Within scheduled periods, remote notify for messages received	OnlyDuringPeriod/AtAnyTime OnlyDuringPeriod => only messages received within scheduled period causes RN to be activated
Days of the Week – Sunday – Monday – Tuesday – Wednesday – Thursday – Friday – Saturday	Business day/Non-business day Business day/Non-business day Business day/Non-business day Business day/Non-business day Business day/Non-business day Business day/Non-business day Business day/Non-business day
<< SCHEDULES >> Period enabled From time (hh:mm:ss) To time (hh:mm:ss) Target DN call-back data P.I.N. number	Three schedule sets: Business days, Non-business days, Temporary Yes/No (Up to 3 periods per schedule) Time in the specified format Time in the specified format (Up to 3 per period) Phone/Tone Pager/Voice Pager/Numeric Pager/Paging Service For Voice Pager: Standard (Notification Only)/Notification and Message For Numeric Pager or Paging Service: Callback/Callback and CLID One DN per Target. Up to 30 digits. Up to 8 digits or asterisks (Only for Numeric Pager Targets) Up to 8 digits or asterisks (Only for Numeric Pager Targets)

Chapter 4: Backup and Restore Utility (burp)

Disks are normally backed up using the regular system administration facility. Lower level access is available through the burp utility package.

Burp (Backup and Restore Package) is a utility used on Meridian Mail for archiving and restoring MI Server volumes. All tapes are retensioned automatically before use.

If you have a corrupted disk or a corrupted volume and you need to restore the system from a tape or disk backup, do not use burp directly but follow the official procedure as described in the *System Installation and Modification Guide* (NTP 555-7001-215).

Commands

autotaperet

Switch off or on the automatic tape retensioning. Under normal circumstances the tape retensioning should be switched on for better tape reliability, which is the default when burp is started. During testing, however, it is sometimes convenient to switch off the tape retensioning as it saves the retensioning time, for example, before using the **tapelist** command. To switch off the automatic tape retensioning, type this command:

```
>autotaperet off  
>
```

Automatic tape retensioning can be reenabled with the command:

```
>autotaperet on  
>
```

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To display whether automatic tape retensioning is on or off, just enter the command with no parameters, for example

```
>autotaperet
Auto tape retension is on
>
```

cleanprofile

Removes all voice message information from a specific profile. The full pathname for the user cabinet must be entered. An example is shown below:

```
>cleanprofile
Full pathname (e.g. /2/users/Smit1234): /2/users/test328051
>
```

copymivol

Copies a complete MI volume from a source disk to a destination disk; the source and destination volume names need not be the same. This command is only provided for testing part of the disk to disk backup, and under normal circumstances would not be used. An example is shown below:

```
>copymivol
Source Volume: VS1T
source MI name: FAST
Destination Volume: VS102T
Destination MI name: FAST
VS1T  percent done 100
>
```

copyprofile

Copies a single user profile from the backup volume to the user volume. The profile only contains the user configuration, and hence the user will lose all voice messages. The backup volumes only exist on multi-node systems, and will only have the user profile information after a partial backup has been completed. This command is useful if a single user profile is corrupted, saving the restoration of an entire volume. An example is shown below:

```
>copyprofile
Enter Backup valid: 901
Enter backed up valid: 202
Enter cabinet name: test328051
>
```

dumptape

Displays specific blocks of a tape in hexadecimal and ASCII. This command is provided for testing purposes only, and would not be used under normal circumstances. An example is shown on the next page.

```
>dumtape
Retensioning tape...
enter volume block size: 1024
enter tape block address: 0
enter number of bytes to read: 512
56533154 20202020 41154464 535CC742 06B58C61 04000001 vs1T A.DdSV.B...a....
25240000 00000000 4F870000 4F8899CC 3399CC33 99CC3399 %$......0...3..3..3..
CC3399CC 3399CC33 99CC3399 CC3399CC 3399CC33 99CC3399 .3..3..3..3..3..3..
CC3399CC 3399CC33 99CC3399 CC3399CC 3399CC33 99CC3399 .3..3..3..3..3..3..
...
```

exittapepkg

If **tape_pkg** was loaded, instead of running or forking burp, this command must be executed before unloading **tape_pkg**. This releases memory back to the system. If this command is not executed then the memory will not be released and there could be operating problems afterwards with insufficient free memory. An example showing the correct way of exiting burp is shown below:

```
>exittapepkg
>quit
>
```

resetbackup

Resets internal parameters to allow backups; this is used when a SEER with a 1555 error occurs, and there are no other backups in progress. There are two possible types of reset:

BURP: Reset the parameters so that burp will work correctly.

Any: Reset the parameters so that burp and the MMI will work correctly.

An example to reset any backups is shown below:

```
>resetbackup
Reset any backup or Burp backup only? Any
Parameters of backup task have been reset
>
```

tapearchive

Archives an offline volume from disk to tape. This command is obsolete; **vsarchive** should be used instead, which can do offline and online backups. However this command is provided for backing up non standard volumes from disk to tape. The following example backs up volume 'XXAB' from disk to tape.

```
>tapearchive
Retensioning tape...
You are archiving from disk to tape.
enter name of volume to be archived: XXAB
```

```
Blocks 0 to 1999 of volume XXAB will be archived on tape.
```

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```
Archived up to block 1999
Completed archive
Do you want to archive another volume? No
```

```
Rewinding tape...
Please remove tape and label it as tape 1
>
```

tapehdr

This command will only read the first tape header to list the volumes on the tape set (for example, which tape number this is, and where the tape starts). This avoids the time spent by the *tapelist* command to scan the entire tape.

To further reduce time spent, the command “autotaperet off” can be issued before *tapehdr* in order to inhibit tape retensions.

An example of the use of the *tapehdr* command is shown below.

```
>tapehdr
Rewinding tape...
This is an MM12 version tape.
This tape contains a backup for: ABC Company XYZ Division
The label for this backup is:    Daily backup
This tape begins with:
```

volume name	time archived	block size	volume size	start block	tape num
VS1T	99 02 14 01:07	1024	20360	0	1

The entire backup contains:

volume name	backup type
VS1	Voice&Data
VS2	Text
SELECTED	SelectiveBackup

```
Rewinding tape...
>
```

Note: The column headings for “This tape begins with:” are described under the *tapelist* command (below).

The column headings for “This tape begins with” in the example above reflect the backup choices made at the MMI.

volume name: The name of the volume backed up. Actual volumes can either have a full or partial backup. A volume name of “SELECTED” refers

to a Selective Backup. Both users and services are in the same selective backup volume.

backup type: The data backed up in the volume. Voice & Data is a full backup. Data Only or Text are partial backups. SelectiveBackup is a selective backup of both users and services.

tapelist

Lists the volumes on a specific tape. An example of the use of the tapelist is shown below.

```
>tapelist
Rewinding tape...
```

volume name	time archived	block size	volume size	start block	tape num
VS1T	99 02 14 22:53	1024	20360	0	1
VS1V	99 02 14 22:53	8192	2125	0	1
VS1B	99 02 14 22:53	1024	1000	0	1
VS2T	99 02 14 23:53	1024	7000	0	1
VS2V	99 02 14 23:53	8192	1000	0	1
VS2B	99 02 14 23:53	1024	1000	0	1
SELECTED	99 02 14 23:53	1024	0	1	1

```
Rewinding tape...
>
```

The columns/headings are described below.

volume name: The name of the volume. A last letter of T indicates a text volume, V indicates a voice volume, and B indicates a temporary volume used by the backup and restore software. A volume name of "SELECTED" refers to a selective backup of user messages and PDL or services.

time archived: This is the time the volume was backed up onto this tape.

block size: The number of bytes in a block for the volume. Text volumes have 1024 bytes in a block. Voice volumes have 8192 bytes in a block.

volume size: The number of blocks in the volume. The total number of bytes is the volume size times the block size.

start block: This field is not zero only if a volume spills over onto a subsequent backup tape. In this case, the start block is the block number within the volume where the second tape begins. Any other volumes beginning on the subsequent tape will have a start block of 0 (zero).

tape num: This field numbers the tapes in case more than one tape is required. Numbering starts at 1. All volumes listed on a given tape will have the same tape number.

taperestore

Restores an offline backup from tape to disk. This command is obsolete; **vsrestore** should be used instead, which can do online or offline restores. However this command is provided for restoring nonstandard volumes from tape to disk.

The example given below restores a volume 'XXAB' on tape to the volume 'FRED' on disk:

```
>taperestore
Retensioning tape...
You are restoring from tape to disk.
This tape backup was created on 70 01 06 at 21:53
Enter tape volume name: XXAB
Restore tape to what volume: FRED
Destination mi name: FAST
This XXAB backup was created on 70 01 06 at 21:53
Block 0 to 1999 will be restored from XXAB to volume FRED
Restored up to block 1999
Volume restore completed
No more volumes on tape.
Rewinding tape...
>
```

taperetension

Retensions a tape. Tape cartridges must be correctly tensioned to reduce tape errors. This is normally done automatically by the software, unless tape retensioning has been switched off with the **autotaperet** command. An example is shown below:

```
>taperetension
Retensioning tape...
Rewinding tape...
>
```

vsarchive

Archives data from disk to tape or another disk. The volumes to be archived can be online (volume server running for the volume) or offline (no volume server running for the volume). There are three different types of backup that can be done:

Profiles_Only: Archive user profiles to volumes VS901 (and VS902 on 2 node systems). This only works for multinode systems, and is the same as a partial backup of the volume.

Text_Volume: Archive the text volume only.

Voice_And_Text: Archive the text and voice volume.

The source node number is the node that contains the volume to be archived. If the destination is to disk, then you are also prompted for the target node number; this is the destination node for the backup volume.

```
>vsarchive
Is this an on-line or off-line backup? on-line
Is this a disk or tape backup? Tape
You are archiving from disk to tape.
Enter id of volume to be archived: (enter 0 for none) 1
Enter backup type: Voice_And_Text
Enter id of volume to be archived: (enter 0 for none) 0
```

```
Retensioning tape first, please wait...
Percentage of volume VS1T   archived: 100%

Percentage of volume VS1V   archived: 100%

Percentage of volume VS1B   archived: 100%

Backup finished

Rewinding tape...
Archive completed.
>
```

vsccleanprofiles

Cleans out all the voice message information on a specific volume.



CAUTION

Risk of data loss

This command should not be used under normal circumstances, as it will delete all user messages on a volume.

```
>vsccleanprofiles
Enter Volume: 202
Voice Cabinets Updated : 89
>
```

vscopyprofiles

Copies all the profiles from the backup volume (VS901 or VS902) to the user volume.



CAUTION

Risk of data loss

This command should not be used under normal circumstances, as it will delete all user messages on a volume.

The backup volumes only exist on multinode systems, and will only have the user profile information after a partial backup has been completed. The example below illustrates the copying of all the user profiles from the backup volume VS901 to the user volume VS202:

```
>vscopyprofiles
Enter Backup valid: 901
Enter backed up valid: 202
Restoring user profiles from VS901 to VS202
Restoring profile for user WOOD8011
25 profiles restored to VS202; 0 profile errors
>
```

vsrestore

Restores volumes from a tape or disk backup, back to the disk. The backup volume name (source) does not have to be the same as the destination volume name.



CAUTION

Risk of data loss

Do not use this command on a volume on a Meridian Mail system that is online. If you do so, the volume will be corrupted.

An example of a restore from an online tape backup is shown below. This command is executed after entering the CI shell.

```
>vsrestore
Is this an online or offline backup? on-line
Are you restoring from Disk or Tape? Tape
Enter id of volume to be restored: 1
Enter destination id of volume to be restored: 3
Enter destination virtual node number: 1
Retensioning tape...
Looking for volume VS1T ...
This VS1T backup was created on 70 01 06 at 21:53
Blocks 0 to 20359 will be restored from VS1T to volume VS3T
Restored up to block 20359
This VS1V backup was created on 70 01 06 at 21:53
Blocks 0 to 2124 will be restored from VS1V to volume VS3V
Restored up to block 2124
This was an online backup
This VS1B backup was created on 70 01 06 at 21:53
Blocks 0 to 999 will be restored from VS1B to volume VS3B
Restored up to block 999
Do you want to restore another volume? No
Rewinding tape...
>
```

4-10 Backup and Restore Utility (burp)

Chapter 5: Operational Measurements (om_util)

Om_util displays Operational Measurements (OM) data from the OM history files. The utility is available from the ETAS level menu. To start up the utility, follow Procedure 5-1. To remove the utility, follow Procedure 5-2.

Procedure 5-1 Starting om_util

- 1 Select Operational Measurements from the ETAS menu.
- 2 Press <Ctrl>—<W>u8 to activate the Cobra control window.
- 3 Position the cursor beside the om_util item and press <Return>.

The ">" prompt appears.

Procedure 5-2 Removing om_util

Note: To gracefully exit the utility, type **quit** at the > prompt before removing the utility.

- 1 Press <Ctrl>—<W> to go to the Cobra control window.
- 2 Use the up arrow or down arrow to move the cursor to "om_util," and press <R> to remove the item.
- 3 Press <Y> to confirm that the item should be removed.
- 4 Use the up arrow or down arrow to move the cursor to "MMI," and press <Return>.

You are returned to the MMI.

Commands

The following commands enable you to view reports:

- OMFLUSH—Flush all OM data (Traffic and Billing data)
- OMUSERSUM—User Usage report
- OMSUMMSG—Billing data summary for specific user mailbox
- OMTVSERV—Voice Service Traffic report
- OMTVMSG—Voice Messaging Traffic report
- OMTCHNL—Channel Usage Traffic report
- OMTNET—Networking Traffic report
- OMTAMIS — AMIS Networking Traffic report
- OMTVMENU—Voice Menu Traffic report
- OMTVOL—Disk Usage Traffic report
- OMTMTA—Message Transfer Traffic report
- OMT1LH — T1 Link Handler Traffic report (MSM only)
- OMSMDILH — SMDI Link Handler Traffic report
- OMTOC—Outcalling Traffic report
- OMTFIS—Fax Delivery Traffic report
- OMBLOC—Local Billing data
- OMBNET—Network Billing data
- OMBAMIS — AMIS Network Billing data
- OMORG—Display OM Options settings
- OMAUDIT—Audit OM data

When a command is run and it requires input, the system prompts the user to enter the data. A default value is always displayed. To change this value, use the up or down cursor key to display the desired value, then press <Return>.

Help text exists for each of the om_util commands. The help message for any command can be seen by typing in the following command and pressing <Return>:

help *command*

OMFLUSH

The OMFLUSH command allows the user to commit all of the OM traffic data and OM billing data which is stored in the memory of the OM server. Executing this command causes all of the data to be written to the disk. Note that this command causes an interval change in the OM traffic reports.

After the OMFLUSH command is issued, the following prompt appears:

```
This will force OM Server to write commit data? Billing
```

The valid options are: billing (this is the default), traffic, or both.

OMUSERSUM

The OMUSERSUM command allows the user to view the User Usage report.

Note: This report will contain data only if “Collect User Usage Data” is enabled in the OM Options.

After the OMUSERSUM command is issued, the following prompts appear (the valid options are shown for reference purposes):

```
Specify Start Date (dd/mm/yy hh:mm) :
Specify End   Date (dd/mm/yy hh:mm) :

Specify Search Pattern: All/LastName/MailBox/Department
Specify Sort Criteria: Alphabetically/By_Department
Include Actual OM Header data: Yes/No
Include Local Billing Data:   Yes/No
Include Network Billing Data: Yes/No
Include AMIS Billing Data:   Yes/No
Specify Start Date (dd/mm/yy):
Specify End Date  (dd/mm/yy):
```

The output will vary depending on your response to the “Yes/No” prompts. The following information is always displayed:

```
DR User SerNo:
DR User Mailbox:
DR User SurName:
DR User FirstName:
DR User Dept:
DR User COS:
```

The following information is displayed if your response is yes to the Include Actual OM Header data prompt:

```
OM Type:
OM User SerNo:
OM User Mailbox:
OM User SurName:
OM User FirstName:
OM User Dept:
OM User COD:
```

The following information is displayed if your response is yes to the Include Local Billing Data prompt:

Record Type:
Date:
Update Flag:
Total Logon:
Total CalAns:
Total PC:
Total Internal:
Total External:
Total Compose Message:
Total MsgRep Msg:
Total MsgFwd Msg:
Session Length:
Message Length:
Disk Used:

The following information is displayed if your response is yes to the Include Network Billing Data prompt:

Record Type:
Date:
Update Flag:
Number of Economy Msg:
Total Duration (Seconds):
Number of Standard Msg:
Total Duration (Seconds):
Number of Urgent Msg:
Total Duration (Seconds):

The following information is displayed if your response is yes to the Include AMIS Billing Data prompt:

Record Type:
Date:
Update Flag:
Number of Economy Msg:
Total Duration (Seconds):
Number of Standard Msg:
Total Duration (Seconds):
Number of Urgent Msg:
Total Duration (Seconds):

OMSUMMSG

The OMSUMMSG command allows the user to view an up-to-date summary of the billing data stored on the disk for a particular mailbox. In order to get the most up-to-date data, use the OMFLUSH command before using the OMSUMMSG command.

Note: This report will contain data only if “Collect User Usage Data” is enabled in the OM Options.

After the OMSUMMSG command is issued, the following prompts appear:

```
Specify Start Date (dd/mm/yy hh:mm) :  
Specify End   Date (dd/mm/yy hh:mm) :
```

The following prompt(s) will depend on whether you have the Network Message Service (NMS) feature installed on a single-customer or multi-customer system. If you have a single-customer system without NMS, you will be prompted for the following:

```
Specify User Mailbox :
```

If you have a single-customer system with NMS, you will be prompted for the following:

```
Specify Networking Mailbox Number :
```

The networking mailbox number is the network location code followed by the mailbox number. If no code is given, the local site is assumed.

If you have a multi-customer system, you will be prompted for the following:

```
Specify Customer Number :  
Specify User Mailbox :
```

The report is displayed in the following format:

Data found for mailbox: ____

Number of Sessions found:
Number of Logon Sessions:
Number of Call Answering Sessions:
Number of External Calls:
Number of Internal Calls:
Number of Call Answering Messages:
Number of Composed Messages:
Number of Reply Messages:
Number of Forwarded Messages:

OMTVSERV

The OMTVSERV command allows the user to view the Voice Service Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy hh:mm) :
Specify End Date (dd/mm/yy hh:mm) :

The report is displayed in the following format:

```
Service Summary Start Interval: 14/02/99 22:59:01
Service Summary End Interval: 14/02/99 23:59:59
Service Name      #Incoming  #InDuration  #OutGoing  #OutDuration
Thru-Dial         0          0            0          0
Voice Menu        0          0            0          0
Voice Messaging   0          0            0          0
Call Answering    0          0            0          0
AMIS              0          0            0          0
Meridian Access   0          0            0          0
Express Messaging 0          0            0          0
Voice Announcements 0        0            0          0
Networking        0          0            0          0
Voice Administration 0        0            0          0
Voice Prompt Admin 0          0            0          0
Time of Day Control 0          0            0          0
Post Check Out    0          0            0          0
Outcalling Agent  0          0            0          0
Delivery to Non-User 0        0            0          0
Remote Notification 0          0            0          0
Remote Activation  0          0            0          0
Voice Forms       0          0            0          0
Transcription Service 0        0            0          0
Fax Print Same Call 0          0            0          0
Fax Print Call Back 0          0            0          0
Fax Info Service  0          0            0          0
Fax Item Maintenance 0        0            0          0
MultiMedia Outcalling 0        0            0          0
VP Diagnostics    0          0            0          0
Enterprise Networking 0        0            0          0
```

OMTVMSG

The OMTVMSG command allows the user to view the Voice Messaging Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy) :
Specify End Date (dd/mm/yy) :

The report is displayed in the following format:

Voice Messaging Detail Summary Start Interval: 00/00/00
00:00:00
Voice Messaging Detail Summary End Interval: 00/00/00
00:00:00
Number of Call Answering Sessions:
Number of Logon Sessions:
Number of Internal Calls:
Number of External Calls:
Number of Compose Messages:
Number of Call Ans Messages:
Number of Reply Messages:
Number of Forwarded Messages:
Message Length (Min Avg Max):
Session Duration (Min Avg Max):

OMTCHNL

The OMTCHNL command allows the user to view the Channel Usage Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy) :
Specify End Date (dd/mm/yy) :

The report is displayed in the following format:

```
Detail Voice Channel Start Interval: 00/00/00 00:00:00
Detail Voice Channel End Interval: 00/00/00 00:00:00
Channel Number #Incoming #InDuration #OutGoing #OutDuration
1 0 0 0 0
2 0 0 0 0
3 0 0 0 0
4 0 0 0 0
5 0 0 0 0
6 0 0 0 0
7 0 0 0 0
8 0 0 0 0
```


OMTNET

The OMTNET command allows the user to view the Networking Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

It prompts for the following information:

Specify Start Date (dd/mm/yy) :
Specify End Date (dd/mm/yy) :

The report is displayed in the following format:

Detail Networking Start Interval: 00/00/00 00:00:00
Detail Networking End Interval: 00/00/00 00:00:00
SiteId:
Messages Delivered to SiteId: U= N= E= A= X=
Messages Received from SiteId: U= N= E= A= X=
Stale Messages U= N= E=
Maximum Connections:
Minimum Connections:
Total Connect Time(Sec):
Number of Unreachable Sites:
Number of No Resources:
Number of Attempts:
Number of Successful Attempts:

OMTAMIS

The OMTAMIS command allows the user to view the AMIS Networking Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy) :
Specify End Date (dd/mm/yy) :

The report is displayed in the following format:

```
Enterprise Networking Detail Start Interval: 00/00/00 00:00:00
Enterprise Networking Detail End Interval: 00/00/00 00:00:00
Messages Delivered to SiteId: U= N= E= A= X=
Messages Received from SiteId: U= N= E= A= X=
Stale Messages: U= N= E=
Maximum Connections:
Minimum Connections:
Total Connect Time(Sec):
Number of Unreachable Sites:
Number of No Resources:
Number of Attempts:
Number of Successful Attempts:
```

OMTVMENU

The OMTVMENU command allows the user to view the Voice Menu and Announcement Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

It prompts for the following information:

```
Specify Start Date      (dd/mm/yy):
Specify End Date        (dd/mm/yy):
```

The report is displayed in the following format:

```
Detail Services Start Interval: 00/00/00 00:00:00
Detail Services End Interval:   00/00/00 00:00:00
Id #Access  0  1  2  3  4  5  6  7  8  9  0  #  *
```

OMTVOL

The OMTVOL command allows the user to view the Disk Usage Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date      (dd/mm/yy):
Specify End Date        (dd/mm/yy):
```

The report is displayed in the following format:

```
Volume Server Usage Start Interval: 00/00/00 00:00:00
Volume Server Usage End Interval:   00/00/00 00:00:00
Volume Id  Voice  Volume (8K Blocks)  Text Volume (1K Blocks)
          Size    Available          Size    Available
VS1
VS2
VS202
```

OMTMTA

The OMTMTA command allows the user to view the Message Transfer Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy):
Specify End Date (dd/mm/yy):

The report is displayed in the following format:

```
Message Traffic Start Interval: 00/00/00 00:00:00
Message Traffic End Interval: 00/00/00 00:00:00
Local Message Transfer
Total Messages Received:
Standard Messages Delivered:
Urgent Messages Delivered:
Economy Messages Delivered:
NDN Messages Delivered:
Ack Messages Delivered:
Average Message Length:
Average Number of Recipients:
Network Message Transfer
Total Messages Received:
Standard Messages Delivered:
Urgent Messages Delivered:
Economy Messages Delivered:
NDN Messages Delivered:
Ack Messages Delivered:
Message Length:
Number of Recipients:
```

OMT1LH

The OMT1LH command allows the user to view the T1 Link Handler Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy):
Specify End Date (dd/mm/yy):

The report is displayed in the following format:

```
T1LH Link Handler Traffic Start Interval: 00/00/00 00:00:00
T1LH Link Handler Traffic End Interval:   00/00/00 00:00:00
T1 Link name:
Number of bipolar violations:
Number of out of frame errors:
Number of extended SF errors:
Backward slip count:
Forward slip count:
```

OMSMDILH

The OMSMDILH command allows the user to view the SMDI Link Handler Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date      (dd/mm/yy):  
Specify End Date       (dd/mm/yy):
```

The report is displayed in the following format:

```
SMDI Traffic start interval: 00/00/00 00:00:00  
SMDI Traffic end interval:   00/00/00 00:00:00  
Messages sent from switch:  
Messages sent to application:  
Errors sending call info:  
MWI requests for invalid DN:  
MWI acknowledgements blocked:  
MWI negative acknowledgements:  
MWI ON requests:  
MWI OFF requests:  
Application logins:  
Application logouts:  
Link outages:  
Requests made while link down:  
Invalid PCI messages received:  
Bad packets/formats detected:
```

OMTOC

The OMTOC command allows the user to view the Outcalling Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy):
Specify End Date (dd/mm/yy):

The report is displayed in the following format:

```
Outcalling Traffic Start Interval: 00/00/00 00:00:00
Outcalling Traffic End Interval: 00/00/00 00:00:00
Total OCS Blocked:
Maximum Active VSS:
Minimum Wait Time(sec):
Maximum Wait Time(sec):
Average Wait Time(sec):
Total Wait Time(sec):
Num of Waiting Periods:
Request Type: Remote Notification
Number of request:
Number of New Attempts:
Number of Retry Attempts:
Number of Successful Delivery:
Number of Cancel Retry:
Number of Other Cancel Retry:
Request Type: Delivery To Non-User
Number of request:
Number of New Attempts:
Number of Retry Attempts:
Number of Successful Delivery:
Number of Cancel Retry:
Number of Other Cancel Retry:
```

OMTFIS

The OMTFIS command allows the user to view the Fax Delivery Traffic report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

Specify Start Date (dd/mm/yy):
Specify End Date (dd/mm/yy):

The report is displayed in the following format:

```
Fax Delivery Detail Traffic Start Interval: 00/00/00 00:00:00
Fax Delivery Detail Traffic End Interval:   00/00/00 00:00:00
Total OCS Blocked:
Maximum Active VSS:
Minimum Wait Time(sec):
Maximum Wait Time(sec):
Average Wait Time(sec):
Total Wait Time(sec):
Num of Waiting Periods:
Request Type:                               Fax Delivery
Number of request:
Number of New Attempts:
Number of Retry Attempts:
Number of Successful Delivery:
Number of Cancel Retry:
Number of Other Cancel Retry:
```


OMBLOC

The OMBLOC command allows the user to view the Local Billing Data report. In order to get the most up to date data, use the OMFLUSH command before using the OMBLOC command.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date      (dd/mm/yy hh:mm) :  
Specify End Date       (dd/mm/yy hh:mm) :
```

The following prompt(s) will depend on whether you have the Network Message Service (NMS) feature installed on a single-customer or multi-customer system. If you have a single-customer system without NMS, you will be prompted for the following:

```
Specify Mailbox Number (Blank for all mailboxes) :
```

If you have a system with NMS, you will be prompted for the following:

```
Specify Networking Mailbox Number :
```

The networking mailbox number is the network location code followed by the mailbox number. If no code is given, the local site is assumed.

If you have a multi-customer system, you will be prompted for the following:

```
Specify Customer Number :  
Specify Mailbox Number:
```

The following prompt will appear:

```
Display Session Trace counters: Yes
```

Note: The information on the generated reports will vary depending on the response to the Display Session Trace Counters prompt.

The following option will appear:

```
Only Display Voice Messaging Records?: No
```

If this field is set to No (default), all session trace records matching the criteria are displayed. If set to Yes, only the Call Answering, Express Messaging, Logon, and ACCESS records are displayed.

Logon call type

The report is displayed in the following format.

```
Message Trace Session Start:  00/00/00  00:00:00
Message Trace Session End:    00/00/00  00:00:00
Session Length:
Client Id:
Call Type:
Call Origination:
Called DN:
Calling DN:
DN Type:
User Logged on:
Compose Messages:
Reply Messages:
Forwarded Messages:
Min Message Length:
Max Message Length:
Total Message Length:
Total Messages end of session:
External Messages Exist:
Unread Messages Exist in SubMbx:
Submailbox number:
Last MWI Action:
```

The following fields are also displayed if Display Session Trace Counters is set to Yes.

```
Msgs Sent/Left This Session:
Timed Delivery Msgs Submitted:
Total Msgs Start of Session:
UnPlayed Msgs Start of Session:
Msgs Arrived During Session:
New Msgs Played This Session:
UnPlayed Msgs End of Session:
Messages deleted during Session:
UnPlayed Msgs Deleted:
```

PC ACCESS call type

The ACCESS report is the same as the Logon report, except that ACCESS Class replaces the following fields:

- External Messages Exist
- Unread Messages Exist in SubMbx
- Submailbox Number
- Last MWI Action

The report is displayed in the following format.

```
Message Trace Session Start:  00/00/00  00:00:00
Message Trace Session End:    00/00/00  00:00:00
Session Length:
Client Id:
Call Type:
Call Origination:
Called DN:
Calling DN:
DN Type:
User Logged on:
Compose Messages:
Reply Messages:
Forwarded Messages:
Min Message Length:
Max Message Length:
Total Message Length:
Total Messages end of session:
Access Class:
```

The following fields are also displayed if Display Session Trace Counters is set to Yes.

```
Msgs Sent/Left This Session:
Timed Delivery Msgs Submitted:
Total Msgs Start of Session:
UnPlayed Msgs Start of Session:
Msgs Arrived During Session:
New Msgs Played This Session:
UnPlayed Msgs End of Session:
Messages deleted during Session:
UnPlayed Msgs Deleted:
```

Express Messaging call type

The report is displayed in the following format.

```
Message Trace Session Start: 00/00/00 00:00:00
Message Trace Session End:   00/00/00 00:00:00
Session Length:
Client Id:
Call Type:
Call Origination:
Called DN:
Calling DN:
DN Type:
Message Disposition:
Total Message Length:
Submailbox number:
Last MWI Action:
```

Call Answering call type

The report is displayed in the following format.

```
Message Trace Session Start: 00/00/00 00:00:00
Message Trace Session End:   00/00/00 00:00:00
Session Length:
Client Id:
Call Type:
Call Origination:
Called DN:
Calling DN:
DN Type:
Message Disposition:
Total Message Length:
Submailbox number:
Last MWI Action:
```

Message Transfer Agent Report

The report is displayed in the following format.

```
Message Trace Session Start: 00/00/00 00:00:00
Message Trace Session End:   00/00/00 00:00:00
Session Length:
Client Id:
Call Type:
Message created at:
Message sent at:
Message to be delivered at:
Sender:
Message Type:
Last MWI Action:
```

Selective Restore

The report is displayed in the following format.

```
Message Trace Session Start: 00/00/00 00:00:00
Message Trace Session End:   00/00/00 00:00:00
Session Length:
Client Id:
Call Type:
Total Messages Restored:
Total New Messages Restored:
Total Msgs Start of Session:
Total Messages End of Session:
Unplayed Msgs Start of Session:
Unplayed Msgs End of Session:
Last MWI Action:
PDLs Restored:
```

Volume Server

The report is displayed in the following format.

```
Message Trace Session Start: 00/00/00 00:00:00
Message Trace Session End:   00/00/00 00:00:00
Session Length:
Client Id:
Call Type:
Total Messages Deleted:
```

OMBNET

The OMBNET command allows the user to view the Network Billing Data report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date      (dd/mm/yy) :  
Specify End Date       (dd/mm/yy) :
```

The following prompt(s) will depend on whether you have the Network Message Service (NMS) feature installed on a single-customer or multi-customer system. If you have a single-customer system without NMS, you will be prompted for the following:

```
Specify User Mailbox (Blank for all) :
```

If you have a single-customer system with NMS, you will be prompted for the following:

```
Specify Networking Mailbox Number :
```

The networking mailbox number is the network location code followed by the mailbox number. If no code is given, the local site is assumed.

If you have a multi-customer system without NMS, you will be prompted for the following:

```
Specify Customer Number :  
Specify User Mailbox :
```

If you have a multi-customer system with NMS, you will be prompted for the following:

```
Specify Customer Number :  
Specify Networking Mailbox Number :
```

The report is displayed in the following format:

```
Network Billing Start: 00/00/00  00:00:00  
Network Billing End:   00/00/00  00:00:00  
Mailbox Number:  
Department Number:  
Recipient SiteId:  
Message Priority:
```

OMBAMIS

The OMBAMIS command allows the user to view the AMIS Network Billing Data report.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date      (dd/mm/yy) :
Specify End Date        (dd/mm/yy) :
```

The following prompt(s) will depend on whether you have the Network Message Service (NMS) feature installed on a single-customer or multi-customer system. If you have a single-customer system without NMS, you will be prompted for the following:

```
Specify User Mailbox (Blank for all) :
```

If you have a single-customer system with NMS, you will be prompted for the following:

```
Specify Networking Mailbox Number :
```

The networking mailbox number is the network location code followed by the mailbox number. If no code is given, the local site is assumed.

If you have a multi-customer system without NMS, you will be prompted for the following:

```
Specify Customer Number :
Specify User Mailbox :
```

If you have a multi-customer system with NMS, you will be prompted for the following:

```
Specify Customer Number :
Specify Networking Mailbox Number :
```

The report is displayed in the following format:

```
Network Billing Start: 00/00/00  00:00:00
Network Billing End:   00/00/00  00:00:00
Mailbox Number:
Department Number:
Recipient SiteId:
Message Priority:
```

OMORG

The OMORG command allows the user to view the OM options settings for the system. These options can be changed in the OM options screen.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Traffic Collection:
Traffic Start Time:
Traffic End Time:
Traffic Period:
Traffic Days Stored:

Billing Collection:
Billing Days Stored:

OM Collect Start Time:
Usage Days Stored:
ACCESS Class:
```

OMCCS

The OMCCS command is similar to the OMTCHNL command except that it summarizes the total channel usage for all channels.

Note: This report will contain data only if “Collect Traffic Data” is enabled in the OM Options.

After the command is issued, the following prompts appear:

```
Specify Start Date (dd/mm/yy hh:mm):
Specify End Date (dd/mm/yy hh:mm):
```

The report is displayed in the following format:

```
Channel Summary Start Interval:      00/00/00  00:00:00
Channel Summary End Interval:        00/00/00  00:00:00
Total Number of Incoming Calls =
Total Duration of All Incoming Calls =
Total Number of Outgoing Calls =
Total Duration of al Outgoing Calls =

Total CCS                               =
```


OMAUDIT

The OMAUDIT command allows the user to force the OM to clean up any old data stored on the disk. To run this command, type **OMAUDIT**.

The system asks for confirmation of the request. To continue, respond with “YES”. An information level SEER is produced at the start and end of the OMAUDIT process.

Session Trace feature

Session Trace is a feature that allows you to obtain detailed information on the state of a user's mailbox, message waiting indicator (MWI), and voice messages at various times. Information is captured each time a user initiates an appropriate session with the Meridian Mail system (including voice messaging, call answering, express messaging, and PC ACCESS), a message is deposited in a user's mailbox, the VS Audit deletes messages, or messages are restored into a mailbox. It is stored along with normal billing data.

Note 1: This report will contain data only if "Collect User Usage Data" is enabled in the OM Options.

Note 2: The OM billing data which provides the session trace information is only kept on the disk for two days.

In order to obtain user mailbox, MWI, and voice message information, use Procedure 5-3.

Procedure 5-3 Obtaining mailbox and MWI information

- 1 Ensure that "Collect User Usage Data" is enabled in the OM options.
If it is not enabled, then there will be no prior session trace data on the system disk.
- 2 Enter the command **OMFLUSH** as described in this chapter.
This command will cause OM_SERVER to commit all of the buffered billing information to the system disk.
- 3 Enter the command **OMBLOC** as described in this chapter.
- 4 When prompted, enter the user's mailbox for the session trace information that you require.
- 5 Enter "Yes" when prompted with "Display Session Trace Counters:" to ensure that the reported data will include the session trace information.
- 6 Set "Only Display Voice Messaging Records" to "No" to display all the different record types.

Chapter 6: SEER Utility (se_util)

The SEER utility (se_util) provides an interface to the SEER (System Error or Event Report) file maintained by the SEER server. This file maintains a record of all system error messages. The SEER utility provides the following functionality for manipulating the SEER file:

- provides system administration-supported functions and allows a manual reset of the overwrite pointer
- allows simulated SEERs to be generated and sent to the SEER server
- allows viewing of the components of the SEER file itself: header, index and SEER records
- provides an option to locate the SEER server task ID and to kill the SEER server
- allows you to change the SEER level in the system
- allows viewing and modification of the Remap table
- allows you to turn on or off SEER filing on disk
- allows viewing SEERs that are stored on disk
- allows you to manipulate the SEER throttling configuration
- allows changing the SEER “commit to file” interval
- allows you to query and turn off alarms
- allows you to view the SEER configuration stored in the system profile

For more information on SEERs, refer to the *SEER Reference Manual* (NTP 555-7001-510).

SEER file structure

Figures 6-1 and 6-2 outline the SEER file and record structure. The SEER file has three segments: the file header, the file index, and the SEER record segment. The utility provides commands for viewing the components of each of these segments.

Figure 6-1
SEER file segments

header segment	max number recs curindex currec oldrec SEERlevel	rewritten (updated) at every commit 1 per SEER file
index segment	oldest indices deleted here..... new (current) indices added here	1 index per 50 SEERs
SEER segment	 XXXXXXXXXXXXXXXXXX	records are overwritten starting with the record after currec EOF marker

Figure 6-2
SEER segment components

File header

maxseer	curindex	currec	oldrec	SEERlevel
---------	----------	--------	--------	-----------

SEER index

date	seqnum	posn
------	--------	------

SEER record

date	seqnum	posn	actnum	actqual	node num	class num	description	severity	TN
------	--------	------	--------	---------	----------	-----------	-------------	----------	----

Note: Please refer to the SEERs manual for a definition of the fields in the SEER.

Running se_util

The SEER server does not need to be running to run se_util. However, the following commands will not successfully complete if the server is down:

- SESEND
- SEDSEND
- AUTOSEND (messages sent to printer only)
- SESTART
- SEKILL (cannot locate server)
- SERESET
- SECONFIG
- SEAUTSEND
- SEWRITE
- SELEVEL
- SETHROTTLE
- SEREMAP
- SEVIEWREMAP
- SESETTIME
- SEOFFALARM
- SEQUERYALARM

Viewing of SEERs should be possible, as long as a SEER file is present on the system volume server.

Commands

Commands can be entered in two formats, either including the parameters on the command line or entering them in response to prompts provided by the utility. Either form will result in the same operation being performed.

Press <Return> after each command or response to a prompt.

Note: For commands which require date/time, use the format “dd/mm/yy hh:mm:ss” (note that 2 spaces separate the date and time.) Leaving them blank or entering them incorrectly causes se_util to default to the oldest and most recent records respectively (that is, all valid SEERs will be viewed).

SEBEGINVIEW

SEBEGINVIEW is used to open the SEER file and to set up pointers to allow the SEER file records within a given time interval to be viewed. This command must be issued before a SEVIEWNEXT or SERESET is called.

To close a file opened using this command, use SEENDVIEW.

SEBEGINVIEW has two parameters, the start and end times of the interval.

sebeginview <“dd/mm/yy hh:mm:ss”> <“dd/mm/yy hh:mm:ss”>

Note: The date/time must be of the given format (note that 2 spaces separate the date and time.) Leaving them blank or entering them incorrectly causes se_util to default to the oldest and most recent records respectively (that is, all valid SEERs will be viewed).

SEENDVIEW

SEENDVIEW is used to close the SEER file after having been opened using SEBEGINVIEW. It should also be used after an SE-prefixed operation has gone into error.

seendview

SEVIEWNEXT

SEVIEWNEXT is used to view the SEER records chronologically.

SEBEGINVIEW must be issued before this command is used in order to open the file and to set up the start and end dates for viewing. For each call of SEVIEWNEXT a single SEER record is displayed. To view the first and all successive records in the interval a separate call to SEVIEWNEXT must be made. When the end of the interval has been reached the message “no more records to display” will be seen. To terminate viewing or to start another session of viewing use the SEENDVIEW command.

The SEER record will be displayed as follows:

seviewnext

```
Seer Record:
Date Stamp: dd/mm/yy  hh:mm:ss
Posn XX Seqnum XX
Error Record:
Class XX Num XX
Errstr xxxxxxxxxxxxxxxxxxxxxxxxx>
```

SERESet

SERESet is used to reset the SEER overwrite pointer to allow the circular SEER file to be used. When the pointer to the current record is about to coincide with the pointer to the oldest record in the file and AutoReset is handled automatically by the SEER server, the overwrite pointer is moved ahead a set number of records, creating a new oldest record.

This operation may also be done manually through se_util using this command. The parameter for this command is a date (using the same format as SEBEGINVIEW) to which the pointer is to be reset. The date must be within the current range of the SEER file or an error will be returned. Before this command is issued a call must be made to SEBEGINVIEW using NULL (default) dates to allow for date validation.

The format for this command is:

sereset <"dd/yy/mm hh:mm:ss">

SESEND

SESEND is used to send simulated SEER messages to the SEER server.

The following options control how the messages are sent:

- IS
- MM
- SE
- PRT

It is recommended to wait for a period of the commit time (usually one minute) before attempting to read this message from disk.

IS:

SEERs are generated using the IS_REPORT procedure. The command format is:

sesend <error number> <"error string"> IS <unit error>

MM:

SEERs are generated using the MM_REPORT procedure. The command format is:

sesend <error number> <"error string"> MM <unit error> <error severity>

SE:

SEERs are generated using the SE_REPORT procedure. The command format is:

sesend <error number> <"error string"> SE <unit error> <error severity> <customer number> <TN>

PRT:

SEERs are generated using the SE_PRINT or SE_1PRINT procedure. The command format is:

sesend <error number> <"error string"> PRT <error severity> <TN> <action number> <action qualifier> <yes/no – for using SE_1PRINT> <data type> <data> ... <data type> <data>

SEDSSEND

SEDSSEND is used to send simulated error messages to the SEER server, using IS_DREPORT format as follows:

sedsend <error number> <"error string"> <unit error> <extra data>

AUTOSEND

AUTOSEND is used to continuously send simulated error messages to the SEER server. You may choose to send either the default record or one of your own.

ATTENTION

This command is CPU intensive.

To end AUTOSEND use <Ctrl> A.

autosend Y

autosend N <errnum> <"errstr">

autosend

Use Default Record (y/n) y
 Enter error number 0 (appears if N is the response above)
 Enter error string (appears if N is the response above)
 Enter # msgs to be sent
 Enter delay (tics) between msgs>

SEAUTOSEND

SEAUTOSEND is similar to the AUTOSEND command except that it can set SEER severity and allow incremental value to the SEER number to be entered.

SECONFIG

Displays all ad_util SEER configurations.

SESTART and SEKILL

SESTART is used to locate (that is, obtain the task ID of) the SEER server.
 SEKILL is used to terminate the SEER server.

Note 1: SEKILL *must* be preceded by a SESTART command.

Note 2: The SEER server restarts automatically after an SEKILL command.

The command formats are:

sestart

sekill

OPENSEER

OPENSEER is used to open the SEER file for viewing SEER records in their “physical” sequential order. The commands MARKERS, INDEX, and SEER may be used with this command. Records viewed in this manner are presented as they appear in the flat file as opposed to the circular file. This means that invalid records that appear between CURREC and OLDREC are visible. Only one call to OPENSEER is needed for any group of successive calls to one or more of MARKERS, INDEX, or SEER. Once OPENSEER has been issued these commands can be used repeatedly in any combination until CLOSESEER is issued. The command format is

openseer

CLOSESEER

CLOSESEER is used to close the SEER opened using OPENSEER. It should also be used after a non-SE-prefixed operation has gone into error. The command format is

closeseer

MARKERS

MARKERS is used to display the SEER file header. OPENSEER must be called before MARKERS can be used. This command displays the following:

markers

```
Pointer Record  
  
Number of Records xxxx  
  
Current Index xxxx  
  
Oldest Record xxxx  
  
Current Record xxxx
```

INDEX

INDEX is used to display the SEER file indices. OPENSEER must precede use of this command. This command displays the following:

index

```
Index Record  
  
Date Stamp dd/mm/yy  hh:mm:ss  
  
Seqnum xx  
  
Posn xx  
  
View another record (y/n)  y
```

Responding Y to the prompt displays the next index. The ">" prompt indicates the end of the file indices.

SEER

The SEER command is used to display the SEERs in the order in which they appear in the flat file. This command displays the following:

seer

```
Seer Records:
```

```

Date Stamp: dd/mm/yy  hh:mm:ss

Posn xx Seqnum xx

Error Record:

Class xx Num xx

Errstr xxxxxxxxxxxxxxxxxxxxxxxxxxxx

View another record?  N=Next, J=Jump, Q=Quit

```

At the “View another record?” prompt, press the up arrow key to display the different response options (Next, Jump, Quit). Press return when the option you want is displayed. Select “Next” to display the next record. Select “Quit” to discontinue the command, and return to the “>” prompt. Select “Jump” to skip a number of records; the following prompt appears:

```
Enter number of records to skip 0
```

Enter your response and a SEER record of the above format will appear. When the last SEER has been viewed, the “>” prompt returns. To view all the records from the top simply issue the SEER command again.

FINDREC

FINDREC is used to locate a given SEER record and/or its index by date. The OPENSEER command must be used before this command is issued. The format of the FINDREC command is:

findrec i “dd/mm/yy hh:mm:ss”

findrec r “dd/mm/yy hh:mm:ss”

findrec

```
Search for an I)ndex or R)ecord?
```

```
Enter date dd/mm/yy__hh:mm:ss
```

```
Date Stamp dd/mm/yy  hh:mm:ss
```

```
Seqnum xx                (appears if I is entered)
```

```
Posn xx                  (appears if I is entered)
```

```
Posn xx Seqnum xx        (appears if R is entered)
```

```
Error Record:            (appears if R is entered)
```

```
Class xx Num xx          (appears if R is entered)
```

Entering **i** to the search prompt displays only the index associated with the given date. Entering **r** displays both the index and the SEER record.

SELEVEL

SELEVEL is used to select the type of SEERs to be printed. All SEERs are retained in the system SEER file. There are four SEER levels:

- Debug level (all SEERs are printed)
- System level (System, Administrator, and Error SEERs are printed)
- Administrator level (Administrator and Error SEERs are printed)
- Error level (only Error SEERs are printed)

Format of the command is

selevel

```
SEER Printout Level: Error
```

Use the up or down arrow key to choose the desired SEER level, and press <Return> to enter your selection. The SEER level selected by this command is stored in the SEER header file and will, therefore, not be changed after a system restart.

DUMPSEER

DUMPSEER is used to dump the SEERs stored in the SEER file into a SEER text file in ASCII format. The RW100 server must be running before this command can be issued. The command will create the file (:RW100:SEERTEXT) containing the requested SEERs in text format. The file can then be viewed or printed.

SEVIEWREMAP

SEVIEWREMAP is used to view the remap table. The remap table is stored in both the master SEER server and the backup SEER server.

The format of the command is:

seviewremap

```
Locate Master or BackUp = Master
```

Enter “Master” if the master SEER server is up, otherwise enter “Backup” if the backup SEER server is up.

SEREMAP

SEREMAP is used to remap the severity of a SEER to a different severity level. This flexibility will allow the administrator/technician to tailor the SEER output to suit their particular needs and functions. The REMAP feature can also be used to remap a whole class of SEER messages.

If both the SEER number and SEER class are remapped, the individual remapping will take precedence. The Remap Table can have a maximum of 50 entries. If “(C)” appears next to a SEER number in the remap table, this means that the whole class will be remapped.

SEERs remapped in this table will take precedence over SEERs which have been remapped through the MMI.

The format of the command is

seremap

```
Modify/Add/Delete an entry in Remap Table? se_Modify
```

Use the up or down arrow key to choose the desired action, and press <Return> to enter your selection.

```
Remap an entire class of SEER? (y/n)
```

If you answer “yes,” the following is displayed:

```
Enter the SEER class to be remapped:
```

If you answer “no,” the following is displayed:

```
Enter the SEER number to be remapped:
```

```
Enter the severity level: ErrInf
```

Use the up or down arrow key to choose the desired level and press <Return> to enter your selection.

SESETTIME

The SEER commit time (that is, how often the SEER is committed to disk) is entered in seconds. The command format is

sesetime <time in seconds>

SEQUERYALARM

This command is used to query the status of a specified alarm. The command format is

sequeryalarm <alarm level>

SEOFFALARM

The alarms can be turned off by generating an “off alarm” SEER. The level of the alarm to turn off must be specified. The command format is

**seoffalarm <alarm severity> <error number> <“error string”>
<error unit> <alarm cause>**

SETHROTTL

The throttling parameters (on/off, threshold, and duration) can be changed by this command. The command format is

sethrottle <on/off> <throttle threshold> <throttle time in minutes>

SEWRITE

SEWRITE is used to query the WRITETOFILE flag to see if SEERs are to be written to the SEER file. It also allows this SEER filing to be turned ON or OFF. The command format is

sewrite <y/n>

The default always toggles SEER filing. Y turns SEER filing on and N turns it off.

Chapter 7: MISA File Utility (md)

The MISA Driver File System Utility (md) is a utility package that provides the commands necessary to perform many of the common file operations on volumes and cabinets.

Commands

Help

In order to get information on the file commands available and their syntax, enter **help fsu**.

CD

The CD command is used to display or change the working cabinet. Entering **CD** displays the current working cabinet.

Entering **CD <pathname>** changes the working cabinet to the specified pathname.

CP

The CP (Copy) command is used to copy files. It has the following syntax:

CP <src pathname> <dest pathname>

It copies the file from the source pathname to the destination pathname.

GETFID

This command gets the unique file ID for the specified pathname. It has the following syntax:

GETFID <pathname>

INV

The INV (Inventory) command can be used to generate a list of all the logical volumes, devices, and servers available to the user on the network.

LS

The LS (ListDir) command can be used to list the contents of a cabinet.

Entering **LS** lists the contents of the current working cabinet.

Entering **LS <pathname>** lists the contents of the specified pathname.

The following options are available with the LS command.

- Entering **LS +e** lists the contents of the cabinet along with SubClass, Class, Date, and Subject information.
- Entering **LS +c** lists the contents of the cabinet along with the Class, and FID.
- Entering **LS +s** lists the contents of the cabinet along with the size (in blocks) of each file.

MKCAB

The MKCAB (make cabinet) command is used to create a new cabinet. Different types of cabinets can be created using this command.

A regular cabinet is created by entering the command:

MKCAB <cabinet name>

A custom cabinet is created by entering the command:

MKCAB <cabinet name> +custom

Similarly, a core cabinet can be created by entering:

MKCAB <cabinet name> +core

MV

The MV (movepath) command is used to replace an existing pathname to a file or cabinet with a new pathname. It has the following syntax:

MV <old pathname> <new pathname>

RM

The RM (Remove) command is used to remove a file or cabinet. It has the following syntax:

RM <pathname>

The RM command has an optional “+M” parameter. Entering

RM <pathname> +M will not physically delete the file. It simply marks it as deleted.

TIDYCAB

The TIDYCAB command can be used to remove ALL files from the cabinet.

To mark the files as deleted without actually deleting the files, enter:

TIDYCAB <cabinet pathname> +Mark

To physically delete the files, enter:

TIDYCAB <cabinet pathname>

The compress operation is also available with the above two commands. It is used to compress the specified cabinet. It has the following syntax:

TIDYCAB <cabinet pathname> +C [+Mark]

To remove only voice messaging from the cabinet, enter:

TIDYCAB <cabinet pathname> +VMONLY

UNDORM

If a file has been marked as deleted using the RM +M command or the TIDY command, the UNDORM command can be used to undo the marked delete. It has the following syntax:

UNDORM <pathname>

7-4 MISA File Utility (md)

Chapter 8: Helix Command Interpreter (CI)

For information about the command interpreter (CI), see the *CLI User Manual & Programmer's Guide* (TD87001).

Conversion log files

The following procedure allows you to view log files after a release conversion on a system has been completed.

Procedure 8-1

Viewing log files after a system conversion

Starting point: After conversion

- 1 Reboot the system into service.
- 2 Go to the ETAS menu (see Procedure 1-1).
- 3 Start a CI window and go to the CI window.
- 4 If you wish to view the organizational conversion log, go to step 5.
If you wish to view the personal profiles, go to step 6.
- 5 To view the information on the organizational profile conversion log, at the CI prompt, type:
`boot100:fieldsupport:convlogs:orglog.text`
Use the spacebar to scroll the screen.
- 6 To view the information on the personal profiles conversion, at the CI prompt, type:
`boot100:fieldsupport:convlogs:perlognn.text`
Where "nn" in perlognn.text refers to the node numbers, that is, 01 to 05 or 01 to 10, if the system is an MSM.
Use the spacebar to scroll the screen.

8-2 Helix command interpreter (CI)

Chapter 9: Corporate Directory Tool (md_dr)

Md_dr is a utility program that can fully access the Meridian Mail directory. It is a package of commands compatible with CLI (the Command Line Interpreter), and it obeys the same interaction guidelines as other Meridian Mail utility programs. Using md_dr, it is possible to perform practically any directory operation. It must be used with caution, however, because it is possible to render the Meridian Mail system partially or completely inoperative.

The directory (DR) is a special purpose database, optimized for the directory application. The directory contains entries for people with Meridian Mail mailboxes, remote users, non-users, as well as certain types of system entries.

Running md_dr

Standalone md_dr

Md_dr can be run from a CI, from another utility, or on the SDE (Software Development Environment). Md_dr can be run on Meridian Mail from the ETAS login menu. Most md_dr commands require that the Directory Server (DRSERVER) be running and accessible to the utility. (An exception is the command DRPRIME which creates a new empty directory).

Loading DR_PKG.AREA

CLI utilities have the ability to load packages of commands using the CLI **LOAD** command. Since md_dr is a CLI package, it can be loaded dynamically from another CLI utility. This simply adds the md_dr commands to those already provided by the first utility. Compared with running md_dr as a standalone program, loading it as a package uses less memory and allows more powerful executables to be written.

Before DR_PKG.AREA (which implements md_dr commands) can be loaded, the directory access software must be loaded. This software is in DR_CLIENT.AREA, and it may already be loaded. If this software is not already loaded in the PD of the host utility, DR_PKG cannot be dynamically loaded.

DR_PKG can be loaded into a true CLI shell. On Meridian Mail, DR_PKG can also be loaded when the system is booted into the CI or into a CI which has been forked explicitly.

SDE execution

Md_dr (and the DR_SERVER) can be run on any XMS-based SDE environment due to the code compatibility of SDE and target environments. An MI_SERVER must be running somewhere on the LAN to allow a disk to be accessed. A Volume Server (VS) must also be available. PDs may differ between the SDE and target environments due to different software packaging. In particular, it is usually necessary to use a special FILESYS area on the SDE to provide the MISA file system and SEER reporting. (The SDE FILESYS provides a way of directing SEER reports to a file or window specifiable in the argstring.)

On a LAN, there can be several distinct directories on different volumes. A program selects which one to access by setting its system volume in the argstring, e.g.: [,2] for the directory on volume 2.

For example: run a VS, DR_SERVER and md_dr on a workstation

```
fork vs m 2 fast >>:console:seers <<:console:seers
fork dr_server [,2] >>:console:seers <<:console:seers
fork md_dr [,2] seer :console:seers >>:console:mddr <<:console:mddr
```

Basic concepts

CLI (Command Line Interpreter)

CLI md_dr takes the form of a package of commands which can be accessed through a CLI shell program. CLI provides many powerful facilities such as directing output to a file (TEE), execs (with control constructs), macros, command recall, help, command abort, package overlays, page pausing, command aliasing, and user-friendly parameter input. For a full description of CLI facilities, see *The CLI User Manual and Programmer's Guide* (TD87001).

Help

A list of all available commands can be obtained by typing **help** at the command prompt dr> . To get a description of all the directory related commands, type **help dr**. Typing **help dradd** gives a description of DRADDENTRY and DRADDMEMBER.

System domain

The organization directory (DR) serves primarily as a repository of user information for Meridian Mail. However, it is also a system database with information about voice services and customer organizations. These two aspects of DR are distinguished by the domain attribute of the DR entries. System information is kept in entries with the domain set to a special system domain value of 32767. All other entries have their domain set to the default domain value of 1.

Directory entries

A directory is a set of entries organized for fast retrieval. Each entry represents one or more communicating entities.

Types of entries

Entry Type Directory entries can be of several different types—each type can have different applicable fields. The following types of entries can be stored in the Organization Directory:

PersNU

A Person Non-User entry corresponds to a person who is not a user on the Meridian Mail node where the accessed directory is stored. The entry can have fields such as given name, initials, surname, generational qualifier (Jr, Sr and so on), or DN (phone number), but it cannot have fields such as userID, cabinetFID or login status. If non-users are entered into the directory, name-dialing can be used. In a networked system, a PersNU entry

can also represent a Remote User. A Remote User is represented by a PersNU entry with a non-local box Address.

PersVO

A Person Voice-Only User entry is used for a person who is a normal voice messaging Meridian Mail user on the node which stores the directory. In addition to fields which hold a person's name, a PersVO entry has fields that describe a user (fields include userID, cabinetFID).

Note: Even if MMPC is used to view a voice messaging mailbox on a PC screen, the user is still a Voice-Only user.

A Satellite user is a user who has a mailbox on this Meridian Mail system but whose phone is connected to a Meridian 1 other than the Meridian 1 to which the Meridian Mail system is directly connected. This situation is supported by the Network Message Service (NMS) feature. A Service Satellite User would be a ServVO entry whose Box Address specified a non-zero location ID.

PersTO

A Person Text-Only User entry. This type of entry would be used for a person who can log on only as a text user. Its fields are almost the same as a PersVO entry. Meridian Mail does not currently support this type of user.

PersVT

A Person Voice-Text User entry. This type of entry represents a person who is both a voice and text user of Meridian Mail.

ServNU

A Service Non-User entry is a directory entry which does not correspond directly to a person. Examples might be the System Administrator, Reception, or the Emergency Hotline. Instead of fields for given name and initials, a service has a name field which is considered its surname for sorting purposes. The name field can be accessed by up to 5 keywords (which are taken from the non-trivial tokens of the service name). Services can have phone numbers and can also be related to contacts which would typically be people associated with the service.

ServVO

A Service Voice-Only entry. This service has a Meridian Mail voice mailbox on the node. This type of user can log in as a voice user and can receive call-answering or voice-messaging messages. It has fields for userID and cabinetFID.

ServTO

A Service Text-Only entry. This is a service which can log in as a text-only user. This type of user is not currently supported in Meridian Mail.

ServVT

A Service Voice-Text entry. This is a service which can log in either as a voice or a text Meridian Mail user.

List

A List entry represents a distribution list which can contain other directory entries of any type (including other lists). A list has a name and Box Address. The Box Address is used to refer to the list when a voice message is composed, and it should not conflict with the Box Address of any user.

ModINU

A Model Non-User entry is a prototype entry used by the administration software to facilitate the addition of many entries which have similar field values. A ModINU entry has the same fields as a PersNU entry.

ModIVO

A Model Voice-Only User entry has the same fields as a PersVO entry.

ModITO

A Model Text-Only User entry has the same fields as a PersTO entry.

ModIVT

A Model Voice-Text User entry has the same fields as a PersVT entry.

Broadcast

The Broadcast DN entry represents the Box Address used to send a voice message to all users on this node. It has the same fields as a List entry.

Note: The following three entries apply to System Domain only.

OrgEntry

The Organization Entry provides a rapid lookup of a customer's FID based on its number (organizational attribute). A name field is also provided for additional information. OrgEntry has the same entry type as the servTO entry and the two entries shares similar characteristics. The main difference is that its domain is a system domain of 32767. It is best to set md_dr to system domain mode using DRDOMAIN SYSTEM to access this entry type.

VSDNEntry

The VSDN Entry provides a rapid lookup of the type of voice service associated with a DN. The name field provides additional identifying information and the parameters are hex values specific to the particular voice service. The VSDNEntry has the same entry type as the servNU entry and the two entries share similar characteristics. The main difference is that its domain is a system domain of 32767. It is best to set md_dr to system domain mode using DRDOMAIN SYSTEM to access this entry type.

VoiceServ

The Voice Service Entry provides a rapid lookup of the FID that belongs to the service identified by its service ID. The entry name, hex parameters, and service type provide additional information. The VoiceServ has the same entry type as the servVO entry and the two entries share similar characteristics. The main difference is that its domain is a system domain of 32767. It is best to set md_dr to system domain mode using DRDOMAIN SYSTEM to access this entry type.

ClassOfService

The Class of Service entry provides the administrative convenience of retrieving classes of service by name, class of service number, or user interface type. The actual definition of a class of service is in the system profile. The Class of Service entry has the same entry type as the ModINU entry and the two entries share similar characteristics. The main difference is that its domain is a system domain of 32767. It is best to set md_dr to system domain mode using DRDOMAIN SYSTEM to access this entry type.

Fast Update entries

For the Hospitality feature, special features have been added to the DR subsystem. In a hospitality system, check-in and check-out operations are performed in response to messages from the hotel Property Management System (PMS). Checking in to a guest room involves changing the name associated with the mailbox from null to the guest's name. These changes are frequent and must be done in less than 2 seconds to avoid problems with the PMS protocol.

This requirement is supported by a new kind of entry which is indexed under fewer keys. A Fast Update entry is not retrievable by given name, sounds-like, department, title, location or position. Fast Update entries are indicated by an unused bit in the media capabilities field. Fast Update entries are also used for residential users in a central office system.

Entry attributes (fields)

Different types of entries can have different sets of fields. Within one type of entry, not all fields will usually be used. The directory stores only the information which is input—the more data which is entered for each entry, the more disk space will be needed to store the directory.

The field names in bold below are the official names used by md_dr for the display and input of entry attribute values. On input, the CLI parsing rules for enumerated types mean that it is not always necessary to type the full name of the field. CLI will use the first match it finds. For example, **givn** can be entered instead of **givname**, **sur** instead of **surname**.

type

The Type attribute indicates the type of the entry. See the section “Types of entries” for a description of the allowed types of entries.

givName

The Primary Given Name attribute is a string field holding the given name of a person or model entry. A given name can be up to 21 bytes long. It can contain one or two tokens. (If more tokens are supplied, they will be stored correctly but some name-title retrievals will not work according to specification.)

surname

The Surname attribute is a string field holding the surname of a person or model entry. For a service, list, or broadcast DN entry, this is the primary name of the entry. The surname field is used when determining the sort order of retrievals from the directory. (For person entries, the givName and

initials fields are also used). The maximum length of the surname field is 41 bytes. For person entries, a surname can contain more than one, two, or three tokens. In this case, spaces are ignored when sorting and matching surnames. For service, list or broadcast DN entries, up to 5 non-trivial tokens of the surname field are indexed as keywords.

inits

The Initials attribute is a string field holding up to 5 initials for a person or model entry. If no initials are specified when a person or model entry is added, the first character of each token of the GivName and giv1 fields is filled in to the initials field in upper case. Any single character tokens entered in either of the given name fields are moved to the initials field.

Note: Periods should not be entered into the initials field.

DN

The Directory Number (DN) or phone number field holds the primary phone number for a person, model or service entry. It can be up to 31 characters long and should include all the dialing codes needed to reach the entry from phones at this location. For example, the DN might be a local extension number, an ESN number complete with the ESN access code, an external number prefixed by a 9, and so on. Any non-numeric entered will be stored, but are not considered significant for searching and matching purposes.

dept

The Department attribute is a string field of up to 33 characters. It can be used to store a department number or department name for a person, model or service entry. If a department name consists of several tokens, each is indexed separately as an access keyword (up to 5 tokens).

loc

The Location attribute is a string field of up to 39 characters. It would typically store the name or code for the company location where a person, model, or service is physically located. (This field is not used in Meridian Mail.)

clientID

A Client ID is a unique, unambiguous identifier for a directory entry. Since several entries can have the same name, or one entry could be stored in several different directories, it is very important to have a well defined identifier to avoid confusion when specifying an entry. Every entry in the directory has a clientID. If an entry appears in several different directories, it should have the same clientID in all directories. ClientIDs are intended to

be globally unique and never reused. Typically, a clientID is assigned by the directory system when an entry is first added to the directory. However, the clientID can be specified by the user if required.

A clientID consists of 3 parts which are used to ensure uniqueness. The OrgNumber is associated with the organization to which the entry belonged when first added to a directory. The SL1CNumber is associated with the system on which the entry was first added to a directory. (In SP-5 and later releases, the OrgNumber and SL1CNumber are derived from the systemID.) The Serial Number is incremented each time a clientID is allocated by the DR_Server. The format for a clientID is :Org:SL1C:SerNo. It is also possible to enter a single number, which is taken as the serial number—the other two numbers will be assigned from the defaults in effect for this directory. If an organization already associates a unique identifier with employees, this could be used as the clientID serial number. The value NIL specifies the nil clientID indicating that a clientID is not being specified in this operation.

userID

The userID field is a string attribute of up to 13 characters used to specify the user ID for a user entry. This is the string which a text user would use when logging on. It is also the file name which will be given to the user's cabinet within the file system. A Voice-Only user never actually uses the userID, but must have a unique one anyway. It is a good idea to be consistent if entering userIDs—either make them all upper case or all lower case.

cabFID

The Cabinet FID field is the file identifier referring to a user's cabinet. Every user entry (PersVO, PersTO, PersV0, ServVO, ServTO, ServVT, ModlVO, ModlTO or ModlVT) must have a cabinet FID. This means that a cabinet must have already been created for the user before the directory entry is added. When replying to a cabinet FID prompt, a pathname can be typed (e.g. /2/users/jsmith) or FID can be entered in numeric form (e.g. .2.-345.9631). The first part of a FID is the numeric volume ID of the disk volume that holds the user's files.

media

The media capabilities field is present in all types of entries. It indicates the types of media that can be sent in messages to the person, service, or list described by a directory entry. By correctly maintaining this information in the directory, it is possible to prevent another user from sending voice messages to someone who can only receive text messages. The media capabilities attribute is an enumerated set.

bxAddr

The box address attribute of an entry consists of a numeric site ID, a numeric location ID as well as a string box ID of up to 18 digits. The format of a box address in md_dr is [siteID+locationID]boxID (e.g., [21+0]2290). A SiteID of 0 is identical to the local siteID assigned to this node. A LocationID of 0 is identical to the prime location for the Meridian Mail system. A Satellite Location refers to any other location ID, for example, a different Meridian 1 whose users are supported via AML PRA links using the NMS option. If either siteID or locationID are omitted, the local site (0) and prime location (0) are assumed. Any non-numeric entered in the boxID portion of a box address are ignored for sorting and matching purposes. Normally a boxID is the same as a user's local telephone extension.

posn

The Position attribute is a 15byte string field for storing a person's position in the organization (e.g., Secretary, President, Contract, and so on). Typically there would be many people with the same position in an organization. (This is not used in Meridian Mail.)

title

The Title attribute is a 33byte string field for storing a person's job title or role (for example, Vice-President of Marketing or Staff Coordinator). Typically a title would uniquely identify one job in the organization. The title attribute is indexed by key word (up to 5 non-trivial tokens). (This is not used in Meridian Mail.)

country

The country attribute stores the name of the country that corresponds to any entry. The value NIL indicates that the operation does not specify the country. If an entry with a NIL country is added, the default country for this directory will be used.

The possible country names are accessed by using the up and down arrow keys when prompted for a country. Internally these are stored according to the 2-letter codes defined in the ISO 3166 standard.

dom

The Domain attribute stores an integer that identifies the mail domain of which the entry is a part. The value -1 is a nil value that indicates that the domain is not specified in this operation. If an entry is added with a nil domain, the default for the directory will be used.

A domain value of 32767 indicates a system domain entry. In this case, entry types are interpreted as their system domain versions. Therefore, ServTO becomes OrgEntry, ServNU becomes VSDNEntry, and ServVO becomes VoiceServ, and ModlNU becomes ClassOfService.

org

The Organization attribute stores an integer identifying the organization to which the entry currently belongs. The value -1 is a nil value indicating that the organization is not specified in this operation. The default value will be used for an add operation.

Note: The organization attribute is different from the orgNumber part of a clientID since it represents the entry's current organization affiliation rather than the organization which first generated a clientID for the entry.

In Release 8.0 and later of Meridian Mail, the organization attribute stores the customer number on a multi-customer system.

mgr

The Manager attribute can be used to store the clientID of a person's manager. The manager-employee relationship is stored using links between directory entries. The manager entry must exist before any employee entries can refer to it. If a NIL clientID is entered, no manager is specified in this operation. (This is not used in Meridian Mail.)

genQual

The Generational Qualifier field is a string of up to 3 characters used to store a generational qualifier for a person entry. Valid generational qualifiers are: Jr, Sr, I,II, III, IV, V, VI, VII. It is permissible to enter Jr. or Sr. (with trailing period). Generational Qualifiers are recognized and handled specially by the directory software. If a generational qualifier is entered as the last token in a person's surname field, it is moved to the generational qualifier field.

EStat

The Entry Status field has 2 possible values: normal and obsolete. It is intended to allow entries to remain in the directory in an obsolete state before being deleted, but it is currently unused.

login

The Login Status attribute indicates the status of a user's account. Possible values are enabled (the user can log on), disabled (the administrator has disabled but not deleted the account), PWExpired (the account is disabled since the password has not been changed in the required period), PWViolation (the account is disabled because excessive attempts to login with an invalid password were detected) and PWExpAndVio (the password has both expired and been violated). Possible responses for the login status prompt can be accessed using the up and down arrow keys.

com0

The DN0 Comment is an 11 character string field for holding a short comment related to the primary phone number of a person, model or service entry. For example, it could indicate the hours when the number is in service, or if the number is a home number or a work number. Since MM11, this field is used to distinguish temporary and permanent remote voice users.

DN1

The Secondary DN field stores a secondary phone number for a person, model or service entry. If no primary DN was entered, the secondary DN will be moved into the DN0 field.

com1

The DN1 Comment stores a comment associated with the secondary DN. There must be a DN1 for there to be a com1. (This is not used in Meridian Mail.)

DN2

The Third DN field stores a third phone number for a person, model, or service entry. (This DN is not used in Meridian Mail.)

com2

The DN2 Comment field stores a comment associated with the third DN. (This is not used in Meridian Mail.)

DN3, DN4, DN5, DN6, DN7

Additional DN field for additional phone numbers for a person, model, or service entry. (These DNs are not used in Meridian Mail.)

com3, com4, com5, com6, com7

Additional Comment fields for comments associated with the corresponding additional DN. (These comment fields are not used in Meridian Mail.)

giv1

The Secondary Given Name field stores another given name for a person or model entry. This can be used to store a nick-name which differs from the primary given name. (This is not used in Meridian Mail.)

Note: Since given name matching is done on a prefix basis, there is no benefit from entering a secondary given name consisting of just the first part of the primary given name. For example, for a person named William, a secondary given name of Bill is useful, but a secondary given name of Will is not needed. The secondary given name is treated the same way that the primary given name field is treated with respect to initials.

detFID

The Detail FID field is the file identifier of a detail file that contains more information about the entry. In particular, the detail file may contain a spoken name (personal verification) for the entry. The detail FID can be entered either as a series of numbers or as a path name (for example .1.-246.1357 or /1/dr/details/88—a detail file is given a filename based on the serial number of the entry's clientID). If NIL is entered for the detail FID, the entry has no detail file and any existing detail file will be deleted.

DR

The Dial Restriction field indicates whether the entry can be name-dialed by external callers using the automated attendant facility. The 2 possible values are externalOK (the default) and noExternal.

cn0

The Primary Contact field. Service Entries (ServNU, ServVO, ServTO, ServVT) can refer to other entries (by clientID) as contacts. For example, an information line might refer to a contact person if problems are noticed. (This is not used in Meridian Mail.)

cn1

The Secondary Contact can only be present if there is a primary contact. (This is not used in Meridian Mail.)

billCI

The Billing Class attribute is a value from 0 to 7 applicable to all User entry types. The default value is 0.

flags

The flags field contains a set of four booleans which can be specified in any combination. These are

- **hasSpokenName** This indicates if a spoken name (personal verification) has been recorded in the detail file associated with an entry. It can only be true if a non_NIL detailFID is specified for the entry.
- **noDistribute** This field indicates whether updates to this entry will affect other directories. It is not currently used.
- **fastUpdate** This indicates that the entry is indexed under a reduced set of keys for improved update performance.
- **noNameDial** This indicates that the entry is not indexed under the name dialing key. This should be used for residential users.

Note: The following attributes are specific to system domain.

name

The Name attribute is for information purposes only and is entered as a character string. The restrictions that apply to the surname attribute apply to the name attribute.

FID

The file ID is the object of searches of the OrgEntry and VoiceServ entries. It is entered in the format for a FID (.xx.yy.zz), where xx is the volume, yy is the block number and zz is the timestamp.

parms

The Parameter attribute is only used by the VSDN and Voice Services entries. It is entered and displayed in hex digits up to a maximum of 39 bytes.

servType

The Service Type attribute is used by the VSDN and Voice Service entries. It matches one of up to 26 voice services specified with mnemonics taken from the MMI. The table below summarizes the service types currently defined in Meridian Mail. Service types 15–17 and 22–25 are not currently used, but are assignable by md_dr for future growth.

Table 9-1
Voice service type mnemonics

No.	Mnemonic	Description
0	VM	Voice Messaging
1	CallAns	Call Answering
2	EM	Express Messaging
3	TS	Extension Dialing
4	NW	Analog Transfer Agent
5	MS	Voice Menu
6	AS	Announcement
7	ACC	ACCESS
8	OC	Outcalling
9	VS	Voice Administration (IVT)
10	PM	Voice Prompt Administration
11	TD	Time of Day Controller
12	HM	Hospitality Messaging
13	CO	Post Check Out
14	RA	Remote Activation
18	AN	Open Access (AMIS) Transfer Agent
19	TR	Voice Forms Transcription
20	VF	Voice Forms Call Interpreter
21	GS	CCA Greeting
– continued –		

Table 9-1 (continued)
Voice service type mnemonics

No.	Mnemonic	Description
22	FI	FI Item
23	FIM	Fax Item Maintenance
26	FOC	Fax Outcalling
29	EN	Enterprise Networking
– end –		

servID

The Service ID is a string that is used to look up a particular service. It is defined for Voice Service entries only. VSDN entries are identified by their DN and OrgEntries by their organization number. The 13 characters in the servID are filled in in two parts. The first 5 characters are the organization number (customer number in the MMI), right padded with asterisks (*). The next 8 characters represent the number of the service IDs in Table 9-1, also right padded with asterisks.

Character handling

Character set

DR is designed to properly handle the full ISO 8859 8-bit character set. This is an upward extension of 7-bit ASCII to include the international characters required by Western European languages. Since the international characters were added to the upper part of the code table and are not present on all keyboards, special handling is implemented in DR to properly sort and match characters according to the requirements of particular languages.

A string field can contain any ISO 8859 alphanumeric or punctuation (except wild-card characters). The CLI backslash escape mechanism can be used to input characters not available on the keyboard. The sorting and matching of international characters is controlled by one or more language modules which may be loaded in a particular installation. In fact, a single directory can support multiple sort orders which are selected by specifying a language module when the directory is opened.

The multi-lingual feature is also the basis of access via the telephone keypad, which can be considered a keyboard for a language having only 10 letters. This is used in the name-dialing and name-addressing features.

Skip characters

A skip character is a character which, while properly stored in a field in a directory entry, is ignored for sorting and matching purposes. In normal string fields, the skip characters are the apostrophe, the hyphen, and the back-quote. In names, spaces are also ignored. In phone numbers and boxIDs, all non-numerics are skip characters.

Stop characters

A stop character is a character which, while properly stored in a field in a directory entry, is significant only as a token delimiter for sorting and matching purposes. Multiple consecutive stop characters are equivalent to a single stop character. In normal string fields, the stop characters are the space, double-quote, ampersand, the parentheses, comma, period, slash, colon, semi-colon, square brackets, curved brackets, no-break space (code 160), and angle quotes (codes 171 and 187).

Retrieval patterns

A retrieval is performed by specifying a pattern which indicates desired values for some of the entry fields. The entries retrieved will satisfy all of the values specified in the pattern.

Wildcard characters

In string pattern fields, several wild card characters can be used:

- Underscore matches any single character
- Plus-Sign matches zero or more characters
- Question Mark in a Name-Title or surname pattern, specifies that a “sounds-like” search is to be done for a person’s surname. It makes no difference where the question mark appears in the pattern.

Note: Any number of underscores and plus-signs are allowed in a string pattern. If the first character of a string pattern is an underscore or a plus-sign then the retrieval may be quite slow. If the pattern contains many plus-signs, the retrieval may also be slow. Underscores and plus-signs cannot be used if question mark is used.

Stop and skip characters are also recognized in retrieval patterns and treated appropriately. A pattern consisting entirely of stop and skip characters is equivalent to a null string.

Keyword retrievals

Certain fields are indexed to support keyword retrievals. These fields include the surname and surname1 attributes of services and lists, the title attribute of people and models, and the department attribute. Up to 5 tokens in a field can be used as keywords.

The keywords are chosen by first ignoring Stop Words, which are trivial words not worthy of indexing. The stop words are language dependent—in English they are *and*, *for*, *of*, and *the*. If there are more than 5 non-trivial tokens, the ones which will be indexed as keywords are the first token, the last token, the second-last token, the third-last token and the fourth-last token.

On retrieval, the pattern field can specify any of the tokens, in any order. All entries with all of the specified keywords will be considered to match.

Pattern Fields

A Pattern Field is a specification of an allowed value (or values) for an entry attribute. A full retrieval pattern consists of many pattern fields, all of which can be filled in with values. A simple pattern is a single pattern field—the other fields are considered to have NIL values which match anything.

If md_dr is in system domain mode (if the domain is set to 32767) then only system domain entries will be retrieved.

nameTitle

The Name-Title pattern field allows the name of an entry to be specified in a free format manner. Most reasonable combinations of given name, initials, surname, and generational qualifier are supported. Secondary given name and/or secondary surname can also be used. One or more keywords of a person's title or a service name can also be specified. Examples are: Bill Vander Zahm, W Vanderzahn Jr, H.Bill Van Der Zahm, Bill, B_II J.L.VanderZ+, Chairman, Chairman of B+ard, Board of Directors Chairman, Bill Vondorzam?. NameTitle retrievals are indexed. The last token of the name-title pattern field is used to form the retrieval key. Name Dialing retrievals are supported by selecting the keypad language (2052) in DROPENOD and then performing nameTitle retrievals using numeric patterns. The letter Q in a name is matched by any of 7, 0 or 1. The letter Z in a name is matched by any of 9, 0 or 1.

DN

The Directory Number pattern field matches all DN entry fields. Non- numerics are ignored when matching DNs. DN retrievals are indexed.

clientID

The Client ID pattern field can be used if the clientID of the desired entry is known, otherwise specify NIL. ClientID retrievals are indexed, and will never match more than one entry.

userID

The User ID pattern field allows retrieval by user ID of a user entry. User ID retrievals are indexed.

bxAddr

The Box Address pattern field allows the user to retrieve an entry by its box address. Box Address is entered in the format [siteID+locationID]boxID (for example [22+0]2290). A siteID of zero indicates the local site. A locationID of zero indicates the prime location, satellite users are retrieved using a non-zero locationID. A siteID of 511 is a wild-card and matches any siteID (ANY may also be used). A locationID of 127 is a wild-card that matches any locationID (ANY may also be used). If the siteID is omitted, any siteID is assumed. If the locationID is omitted, any locationID is assumed.

Note: Specifying a non-null boxID pattern in conjunction with either any site or any location will result in error 3172 since this retrieval is disallowed. If the siteID is omitted, the local site is assumed. Retrievals on box address are indexed. Wildcards can be used in the boxID part of a box address and any non-numeric are ignored.

type

The Type pattern field allows constraints to be specified for the type of entries to be retrieved. Possible values can be accessed by using the up and down arrow keys at an entry type prompt. In addition to the entry type field values (PersNU, ServVT) which specify an exact entry type, there are many entry type patterns which are satisfied by more than one type of entry. The entry type patterns are

- Any (any entry type)
- Person (any person)
- Service (any service)
- Model (any model)
- PersServ (any person or service)
- PersModl (any person or model)
- User (any person, model or service user)
- NonUser (any non-user), V (any voice user)
- T (any text user)
- VO (any voice-only user)
- TO (any text-only user)

- VT (any voice-text user)
- BCast (Broadcast DN)
- PSM (any person, service or model)
- PSCL (any person, service or list)
- TPersServ (any person or service text user)
- VPersServ (any person or service voice user)
- PersUser (any person user)
- ServUser (any service user)
- ModlUser (any model user)
- PMUser (any person or model user)
- PMNU (any person or model non-user)
- LBC (a list or broadcast DN)

Any entry type retrieval that specifies only non-persons or only user entries can use an index.

dept

The Department pattern field can be used to give one or more keywords to be matched against the department field. This retrieval uses an index.

loc

The Location pattern field specifies the location and uses an index.

posn

The Position pattern field specifies the position and uses an index.

givName

The Given Name pattern field specifies the given name and can match either the primary or secondary given names of a person or model entry. The retrieval is indexed. The pattern will match if the given name pattern matches the beginning of any one of the given name fields of the entry.

inits

The Initials pattern field specifies up to 5 initials which are compared in order with the initials attribute of an entry. All initials must match either one of the characters in the initials field of the entry, or the first character of one of the given names. There is no index on initials.

surname

The Surname pattern field specifies the surname of a person or model entry. It makes use of an index.

genQual

The Generational Qualifier pattern field specifies a generational qualifier for a person or model. If supplied, the generational qualifier must match. There is no index on generational qualifier.

title

The Title pattern field specifies one or more keywords of a person or model title. It uses an index.

mgr

The Manager pattern field specifies the clientID of an entry's manager. There is no index on the manager field.

contact

The Contact pattern field specifies the clientID of one of a service's contacts. There is no index for this retrieval.

dialRestrict

The Dial Restriction pattern field can have 3 possible values: dontCare (any value of the dial restrict field is allowable), noExternal (only entries with dial restrict = noExternal are allowed), and externalOK (only entries with dial restrict = externalOK are allowed). There is no index on dial restrict.

volumelD

The Volume ID pattern field allows retrieval of all users which have cabinets on a given disk volume. It makes use of an index.

country

The Country pattern field allows the country to be specified in a retrieval. Use up and down arrow keys to access the country names supported by md_dr. There is no index on country.

COS

The COS pattern field specifies the class of service for user and COS entries. For user entries there is no index on COS. COS entries themselves are indexed.

dom

The Domain pattern field allows the domain of an entry to be specified. This is not indexed.

org

The Organization pattern field allows the organization number of an entry to be given. This is not indexed.

EStat

The Entry Status pattern field has 3 values which can constrain values of the entry status attribute of an entry: any (any entry status allowed), obsolete (only obsolete entries are allowed), and normal (only normal entries are allowed). If obsolete entries are specified, an index is used, otherwise no index is used.

login

The Login Status pattern field allows for the retrieval of users with particular login status values. Specifying “disabled” will retrieve any users with a login status of disabled, PWExpired, or PWViolation. A retrieval on anything except “normal” or “any” can use an index.

UIFType

The UIFType pattern field specifies the user interface type used by the class of service entry. This is indexed, but the COS pattern field should be filled in as well.

COSType

The COSType pattern field specifies the class of service type applicable to a class of service entry. This is indexed, but the COS pattern field should be filled in as well.

Retrieving system domain entries

Retrieval of system domain entries follows the same rules as non system domain entries, including wildcards and indexing. The following attributes are retrieved in exactly the same way for all system domain entries: Type, org, Estat, ClientID. Retrievals by “name” follow nameTitle pattern rules and are indexed. Retrievals by DN follow DN rules and are indexed. Retrievals by servID follow userID rules and are indexed. Retrievals by servType can be for any service type or for a specific service type and are indexed.

When in system domain mode, the domain pattern is automatically set to the system domain value. If in default domain mode, system domain entries can be retrieved by explicitly setting the domain pattern to 32767.

Retrieval order

When a retrieval pattern results in a multi-match, the entries are retrieved in a well defined order. First, the entries are sorted in terms of the attribute whose value was specified in the retrieval. Entries that share the same attribute value are sorted by name.

Person and Model entries are sorted by last name, first name, and initials (spaces in surname and first name do not affect the order). Services and Lists are also sorted by name but spaces are significant. Entries with the same name sort are retrieved first in order of location (an initial numeric first token is treated as a street number), next in order of DN, and finally by clientID. System domain entries are sorted by their native attribute; OrgEntries are sorted by organization, VSDN entries are sorted by DN, and Voice Services are sorted by service ID.

If a retrieval pattern specifies values for several pattern fields, one of those pattern fields is chosen as the driving pattern field. This choice uses a simple strategy based on the length of the pattern field value and the expected degree of multi-match for that attribute. For example, DNs are expected to be more unique than position, so if both DN and position were given in the pattern, entries would be retrieved in order of DN.

If no indexed pattern field is specified, all entries will be filtered and retrieved in order of name.

To retrieve all entries of an indexed field in order, use a nil pattern except enter a single plus-sign(+) in the pattern field on which the sort is to be performed. Only entries that have a value for this field will be returned.

A retrieval of all users may result in an order which is slightly anomalous. Such a retrieval drives on the volumeID index; entries are retrieved first in order of the volume which holds their cabinets, and then in order of name.

Control block (DRCB)

Most access to a directory requires a DR control block (DRCB). Md_dr can handle up to 5 separate DRCBs at a time. Each DRCB used for retrieval requires about 6Kbyte of memory which is taken from md_dr memory resources when a DRCB is opened. Md_dr allocates a total of 65Kbyte of memory for its operations.

The Global commands and the Update Utility commands have their own private DRCBs to perform whatever operations are required. The space for these DRCBs comes from the same md_dr memory resources.

Certain information and status operations do not require DRCBs.

Current entry

Md_dr has a memory-resident variable to hold input or the last entry retrieved. This variable can be used as a staging area to set up entries before updating the directory.

Note: Changing the current entry does not update the directory unless an explicit update command is issued.

If an error is detected, md_dr will usually display the current entry.

Note: Depending on the operation that is performed, this is not necessarily the entry that is related to the error.

Multiple servers

Usually a single directory server runs on node 1 VS1 of a Meridian Mail system. On the SDE, a single directory server would run per volume. However, it is possible to have a second, third, or fourth directory server running on a volume and accessing its own directory files. The typical use of a second server would be for directory conversion or recovery (see Dump and Reload utility commands in this chapter).

From md_dr, access to a second directory is obtained by filling in a new server prompt on certain commands. By default the server is set to 0 (zero). So to access one of the other directories, use a server number in the range 1 to 3.

Second directories are created by utilities (Online DR Reload/conversion) or by the md_dr DRPRIME command with a server number other than 0. Access to a second directory must be gained through a DR_SERVER with the command:

```
fork dr_server number 2 << :console >>:console
```

The default directory files are under the cabinet /1/dr. If one of the second directories is used, the files will reside under /1/dr.n/dr, where n = 1, 2, or 3 is the directory number (e.g., /1/dr.2/dr).

On the application side, the server number is maintained in the DRCB and is set when the directory is opened (dr_OpenOD). A single DRCB will only access one directory. However, several directories may be accessed at once with several DRCBs. The server number is specified in the advice used when opening the directory. It may also be changed using dr_ChgAdvice.

Commands

Md_dr commands all begin with the prefix DR to avoid name conflicts with commands provided by other loaded packages. It is not necessary to type the entire command name—only enough characters to uniquely specify the command are required. Shorter aliases can also be defined using the CLI alias command.

Commands are provided to call all the procedures in the DR_PROCS interface as well as provide useful directory utility functions.

Most of the commands in md_dr require parameters to be inputted. If these parameters are not entered on the command line, the user is usually prompted for them. When the prompts appear, a default value is displayed after the prompt. This default may be line-edited using the normal CLI procedures. Depending on the type of parameter, possible choices may sometimes be obtained by using the up and down arrow keys. Entering an invalid value usually causes a display of valid values and repetition of the prompt.

Unless otherwise indicated, a command returns null string if it is successful. If an error occurs, the integer error code is returned. If the file ISERRORS is available, a diagnostic string will usually also be provided. Some error conditions may result in SEERS which may contain additional information about the error condition.

Basic commands

DROPENOD—Establish Directory Access

This command allocates memory from the md_dr heap for a control block (DRCB) needed for directory access. Many md_dr commands require a DRCB, so DROPENOD should usually be one of the first commands entered in an md_dr session. About 6Kbyte is needed for retrievals. About 2Kbyte is needed if only updates are done. Up to 5 DRCBs can be open at once, but only the current one can be used. DROPENOD sets the specified DRCB to be current. Optional parameters can be used to specify advice parameters to control access for this DRCB.

Parameters to DROPENOD are

DRCB Number

Specifies which of the 5 DRCBs is to be used. If the specified DRCB is already open, it is made the current DRCB. The default is 1.

Options

Specifies a set of options for the DRCB. Possible options are: extraBuffering (use additional memory on retrievals to speed up repeated localized accesses), updateWait (if updates are disabled or an audit is running, block until updates are reenabled), nonAsynch (perform updates in synchronous mode—the command will not return until the update has been completed), and PgmOwnsCB (directory files are not closed when the tasks opening them dies but only when the program opening them dies). Multiple options are separated by spaces. The default is no options.

Max Entries To Filter

Specifies a limit on the number of entries to be examined before a match is found. The default is a very large number.

Language

Specifies which of the available, loaded language modules are to be used for matching and sorting in retrievals. Typically only English (language ID 0) and the telephone keypad (language ID 2052) are available. (NOTE: DR language modules should not be confused with voice prompt languages.) Other languages are: Swedish (1), French (2), German (3), Norwegian (4), Finnish (5), Spanish (6), Italian (7), Canadian French (9). The default is 0.

Unlike other commands, DROPENOD does not prompt for all missing parameters. If no parameters are provided, DRCB 1 is opened using default advice. If only a DRCB number is given, that DRCB is opened using default advice (or made current if already open).

Example: open DRCB 1 specifying options and name-dialing “language,” with the default server 0

```
dropen 1 “nonA upd ex” * 2052 0
```

Server

Specifies which directory server to access. The value ranges from 0 to 3, with 0 being the default.

DRADVICE—Change the Advice in an Existing DRCB

This command allows the advice parameters of the current DRCB to be changed. The parameters are Options, Max Entries To Filter, Language, and Server as in DROPENOD.

DRCLOSE—Close a DRCB

This command returns the memory used by a DRCB to the heap. It displays the amount of heap remaining (after the close has been performed).

The only parameter is

DRCB Number

Specifies which DRCB is to be closed. If it is omitted, the current DRCB is closed.

DRREOPENOD—Refresh DRCB's View of the System

This command is functionally equivalent to a DRCLOSE followed by a DROPNOD, except that the heap used by DCRB is not released. Instead, the existing DRCB is reinitialized, and if a file is open a dd_ChgMode will update the DRCB's view of it in order to release file system resources.

DRGETOMS—Display Operational Measurements

This command does not require an open DRCB. It obtains various information from the DRSERVER and displays it.

The parameters are

Reset

If the parameter RESET is passed in, traffic statistics will be set to zero in the server. The default is NORESET.

Server

This parameter specifies which directory to obtain information about. The default is 0, and values range from 0 to 3.

Various pieces of information will be displayed, including directory statistics and parameter settings. Some of the statistics about entries are broken down into five categories of entries: PersNU (person non-users), PersUser (person users), serv (services), list (lists), and other (models and broadcast DN). One extra category is currently unused.

The data displayed is

#entries

The number of entries of the indicated category in the directory.

#indexEnts

The number of index entries for this category.

Dividing this by the number of entries gives the average number of keys per entry (which, since an entry is replicated under each key, is also the average number of copies of each entry stored).

Note: This value is not exact but is a good approximation for large directories.

#distinctKeys

The number of distinct key values under which entries in this category are indexed. Dividing this into the number of index entries gives a measure of the average degree of multimatch in the directory. This value is not exact.

#detailFiles

The number of entries in this category that have detail files.

#listMems

The number of times that an entry of this category is a list member.

Total Size

The total size in bytes of all entries of this category (in packed format). When divided by the number of entries, this gives the average size of each entry. Multiplying the average size by the average number of keys per entry gives the amount of disk space needed on average for each entry.

#files

The number of secondary index files. This determines the size of the primary index, and, therefore, the cache space required by the server.

#rootOFlows

The number of secondary index files whose size is larger than optimum. This is a measure of how much rebalancing (by the auditor) is needed.

serverState

The state of the DRSERVER. The states are: 0 (normal, updates enabled); 1 (updates disabled); 2 (audit in progress); 3 (audit in progress, updates will be disabled when done); 4 (normal but server paused); 5 (paused and updates disabled); 6 (paused and auditing); 7 (paused, auditing and updates disabled.)

lastCID

The last clientID serial number allocated by the DRSERVER.

#cacheRequests

The number of times the cache has been accessed since the last audit. This is a measure of retrieval traffic.

system ID

This is a longInt that uniquely identifies this directory. It is used to generate clientIDs which will never duplicate those generated at any other site.

#addEntry

The number of entries added to the directory.

#delEntry

The number of entries deleted from the directory.

#chgEntry

The number of entries changed in the directory.

#addMem

The number of times an entry was added to a list.

#delMem

The number of times an entry was deleted from a list.

autoAuditTime

The time of day at which an audit will automatically be started if required. This should be a time of low load since updates will be disabled and performance will be impaired. If automatic auditing is disabled, the word "noAutoAudit" will be displayed.

auditTimeLimit

The maximum number of hours and minutes at which an audit is allowed to run.

#Langs

The number of language modules loaded in the DRSERVER.

auditAdvice

A set of advice options currently in effect to control directory auditing. Possible options are: underFill (balance so that secondary index files are smaller than their optimum size); shrink (fill all files to their optimum size because, without this, rebalancing is only done to reduce the size of files which are too full); noReBalance (rebuild the primary index without rebalancing the secondary index files); noCompact (do not compress fragmented secondary index files); overFill (balance so that secondary index files are larger than their optimum size.)

audit status

If an audit is in progress, BAD PRIM IND will be displayed along with the name of the secondary index file currently being processed. This allows for monitoring of the progress of an audit.

DRDOMAIN—Switch Mode Between System Domain and Default

This command allows you to change to the system domain mode, or if you are currently in system domain mode, it allows you to go back to the default domain.

To display the current mode, enter this command without any arguments:

```
drdomain
```

To change from the default domain to the system domain enter:

```
drdomain system
```

To change from the system domain to the default domain enter:

```
drdomain 1
```

In system domain mode, only system domain entries will be added or retrieved. In default domain mode only non-system domain entries will be added or retrieved unless the domain is explicitly specified as 32767.

DRSIMPFind—Find Entry Satisfying Simple Pattern

This command performs a retrieval based on a single pattern field. If an entry is found which matches the pattern, it becomes the current entry and is displayed. If more than one entry matches, the first one is retrieved and the message “multi match . . .” is displayed. The DRNEXTENTRY command can then be used to retrieve the other matching entries one at a time. If no entries match, the message no match is displayed.

The parameters are

pattern field

This is the name of the specified pattern field. See the section entitled “Pattern Fields” for a description of available pattern fields.

pattern value

This is the value of the selected pattern field.

Example: start a retrieval using name-title pattern

```
drsimp name “dav smith”
```

DRFINDENTRY—Find Entry Satisfying a Full Pattern

This command performs a retrieval based on a full pattern in which all the possible pattern fields can have values specified. Only entries matching all the pattern fields will be retrieved. If an entry is found which matches the pattern, it becomes the current entry and is displayed. If more than one entry matches, the first one is retrieved and the message “multi match . . .” is displayed. The DRNEXTENTRY command can then be used to retrieve the other matching entries one at a time. If no entries match, the message “no match” is displayed.

This command prompts for values for all possible pattern fields. See section entitled “Pattern Fields” for a description of these fields and their order. If no parameters are provided, a prompt for pattern field values appears. If some, but not all values are provided on the command line, the remaining pattern field values are assigned NIL values.

Example: start a retrieval specifying name-title, department and location

```
drfind “dav smith” accounting “new york”
```

DRCONTSCAN—Continue a Retrieval Based on Pattern and Marker

This command performs a retrieval with either single pattern field or a full pattern and includes a marker. Its behavior is similar to DRSIMPFIND and DRFINDENTRY, except that the marker specifies the exact starting point of the retrieval. This command is intended to continue a retrieval from where it was left off. The marker is obtained with DRGETMARKER.

The parameters are similar to those for DRMULTIFIND, and are described below:

Pattern Type

Possible values are “simple” to specify a single pattern field like DRSIMPFIND, or “full” if a full pattern is to be given like DRFINDENTRY.

Pattern Field

For a simple pattern type, this indicates which pattern field is to be specified.

Pattern Value or Full Pattern

For a simple pattern type, this gives the value of the pattern field.

If a full pattern is specified in the pattern type parameter, all pattern values are inputted. (See the examples for the DRMULTIFIND command.)

Marker Client ID

This is either the Client ID of the entry to continue the scan from, or NIL.

Marker Key

This is the key of the entry to continue the scan from. It is usually generated by DRGETMARKER.

Example:

```
drcontscan s name "dav smith" :10:1724:123 "F243
4247 4343 4748 4001 0000 0000 0000"
```

DRGETMARKER

This command marks the current place in a retrieval for later use by DRCONTSCAN. It generates a marker which is kept in a global variable in md_dr so it is presented as the default marker in DRCONTSCAN.

There are no parameters.

DRSETMARKER

This command sets the md_dr global marker variable for later use in DRCONTSCAN. Its primary use is to cancel out the global marker variable since DRCONTSCAN simply uses whatever value the marker happens to be set to.

The parameters are

Marker Client ID

This is either the Client ID of the entry to continue the scan from, or NIL.

Marker Key

This is the key of the entry to continue the scan from. It is usually generated by DRGETMARKER.

DRXPANDMEMBERS—Retrieve the Members of a List

This command retrieves the first member of a list, displays it, and makes it the current entry. If the list contains more than one entry, the message "multi match . . ." is displayed and DRNEXTENTRY can be used to retrieve the other members one at a time. If there are no entries in the list, no match is displayed.

The parameter is

List Client ID

This is the clientID of the list to be expanded. The default is the last list entry retrieved.

Example: expand list with clientID serial number 8765
drx 8765

DRNEXTENTRY—Retrieve Next Entry in Multi Match

This command can only be used if a multi match retrieval or list expansion has been initiated by DRSIMPFIND, DRFINDENTRY or DRXPANDMEMBERS. It retrieves the next entry, displays it, and makes it the current entry. If there are further entries to be retrieved, the message “multi match . . .” is displayed. If the last entry was already retrieved before this command was issued, the message “no match” is displayed and no entry is retrieved.

There are no parameters.

DRPREVENTRY—Retrieve Previous Entry in Multi Match

This command can only be used if a multi match retrieval or list expansion is in progress. It retrieves the previous entry, displays it and makes it the current entry. If there are further entries to be retrieved (going backwards in descending order), the message “multi match . . .” is displayed. If the first entry was already retrieved before this command was issued, the message “no match” is displayed and no entry is retrieved.

There are no parameters.

DRLASTENTRY—Retrieve Last Entry in Multi Match

This command can only be used if a multi match retrieval or list expansion is in progress. It retrieves the last entry (in ascending order) which will be retrieved by the multi match retrieval, displays it and makes it the current entry. DRPREVENTRY can then be used to retrieve other entries in descending order.

Note: This command can be slow if there are many matches.

There are no parameters.

DRSCANGOTO—Skip to Position in an Active Scan

This command can only be used if a multi match retrieval or list expansion is in progress. It retrieves the first entry in the scan (running from the beginning), which matches one or both of the criteria specified as parameters. If no entry satisfies a criterion, the “no match” state is set.

This function is intended to support repositioning at the desired position within a multimatch retrieval after an update has been performed. It will note any updates performed by any DRCB.

Note: This command can be slow if there are many matches or list entries.

The parameters are

client ID

If this is non-NIL, the scan will be positioned at the entry having this clientID.

index

If this is not -1, the scan will stop at the indexed entry in the scan.

Example: go to specified clientID or 10th entry whichever comes first
drsc :345:-873:4258 10

DRMULTIFIND—Retrieve All Entries Matching a Pattern

This command combines either a DRSIMPFIND or DRFINDENTRY with enough DRNEXTENTRYs (or a DRLASTENTRY and DRPREVENTRYs) to retrieve all entries matching a pattern. (See the section entitled “Pattern Fields”.) The direction of retrieval may be specified as descending order by setting the DRBACKWARDS flag. As each entry is retrieved, it is displayed. When the retrieval is complete, a count of the number of entries retrieved is displayed.

The parameters are

Pattern Type

Possible values are “simple” to specify a single pattern field like DRSIMPFIND, or “full” if a full pattern is to be given like DRFINDENTRY.

Pattern Field

For a simple pattern type, this indicates which pattern field is to be specified.

Pattern Value

For a simple pattern type, this gives the value of the pattern field.

or

Full Pattern

If a full pattern is specified in the pattern type parameter, all pattern values are inputted.

Examples:

drmultif s name "dav smith"

drmultif f "dav smith" accounting "new york"

DRMULTIXPAND—Expand All the Members of a List

This command combines a DRXPANDMEMBERS with enough DRNEXTENTRYs (or a DRLASTENTRY and DRPREVENTRYs) to retrieve all the entries in a list. The direction of retrieval can be reversed by setting the DRBACKWARDS flag. As each entry is retrieved, it is displayed. When the retrieval is complete, a count of the number of entries retrieved is displayed.

The parameter is

List Client ID

This is the clientID of the list to be expanded. The default is the last list entry retrieved.

DRREFERENCES—Start Retrieving Referring Entries

This command begins a retrieval of the clientIDs of entries that refer to a given entry. Currently, one entry can refer to another in 3 different ways: a person entry can be referred to by an employee's position, a service entry can be referred to by an entry which is its contact, a list entry is referred to by its members. For example, this command (in conjunction with DRNEXTREFERRER) can be used to find all the employees under a manager, all the services for which a person is the contact, or all the lists of which an entry is a member.

If there are any entries that refer to the specified entry, the clientID of the first reference entry is displayed. If there is more than one reference, the message "multi match . . ." is displayed. If there are not any references, the message "no match" is displayed.

The parameters are

Type of Reference

Possible values are anyRef (any reference), lists (lists of which the entry is a member), employees (employees of a manager), and isContactFor (the services for which an entry is the contact).

ClientID

The clientID of the referenced entry.

Example: find employees of entry :10:5:5432
drref emp :10:5:5432

DRNEXTREFERRER—Retrieve Next Referring Entry

A scan of references must have been initiated by the DRREFERENCES command. This command displays the clientID of the next referring entry. If there are more, the message “multi match . . .” is displayed. If there were none, the message “no match” is displayed.

There are no parameters.

DRINFO—Get DRCB Information and Detail VolumeID

This command displays information about the current DRCB. This command does not require a currently open DRCB—valid information is still retrieved from the server.

It has no parameters.

The information displayed is:

Options

The advice options set into the DRCB by DROPENOD or DRADVICE.

MaxCost

The maximum number of entries to filter as set by DROPENOD or DRADVICE.

Language

The ID of the language module being used by this DRCB.

Default Country

The default country for the directory.

Default Domain

The default domain identifier for the directory.

Default Organization

The default organization identifier for the directory.

Type of Directory

This is always the OrgDir. server.

Local Site ID

The siteID of this site from the networking database (0 if none).

Detail Volume ID

The volumeID where detail files are to be created.

Update commands

Unless the nonAsynch advice has been set into a DRCB, the DRSERVER may still be working on an update after the command appears to be complete. If a retrieval is done immediately after an update using the same DRCB, the retrieval may have to block until the update is complete in order to ensure a consistent view of the directory from that DRCB. A subsequent update (by any DRCB) will also have to wait until the previous one is complete.

DRADDDENTRY—Add a New Entry to the Directory

This command adds a new entry to the directory and sets the value of currEntry. The field values of the new entry can be provided on the command line or as responses to prompts. If the clientID value supplied is NIL, a new clientID will be allocated and displayed.

The parameters are the field values of an entry.
See the section entitled “Directory Entries” for details.

Example: add entry giving name, phone number, department and location
draddent john smith j 2456 “mail room” miami

Since there are so many possible entry fields when md_dr is prompting, it allows you to use default values for most of the fields by entering <carriage-return> when prompted.

Note: This carriage-return is not a real parameter.

DRPARSENAME—Parse a User’s Name

This command breaks down a name into the four-name fields used by the DR. It does not do a directory update, but is included here since it does the same processing on names as DRADDDENTRY.

The parameters are

givName

The given name of the user.

surName

The user’s last name.

inits

The user’s initials.

genQual

The user’s generational qualifier. for example, Jr., III, and so on.

DRDELENTY—Delete an Existing Entry from the Directory

This command deletes an entry from the directory.

The parameter is

clientID

The clientID of the entry to delete.

DRCHGENTRY—Change an Existing Entry in the Directory

This command changes the value of an entry in the directory. The new field values can be provided on the command line or as responses to prompts (see the section entitled “Directory Entries” for details). The clientID must be provided and must refer to an existing entry. This determines which entry is to be changed.

DRADDMEMBER—Add a Member to a List

This command adds an existing entry to an existing list in the directory. The position of the entry in the list can be controlled.

The parameters are

List ClientID

The clientID of the list to which the member should be added. The default is the last list accessed.

Member ClientID

The clientID of the member to add to the list.

After Member Number

Where in the list to add the new member. The value 0 results in the new member added to the beginning of the list. The value -1 results in the new member added to the end of the list. Any other value n results in the new member added after the current member n in the list (that is, as member n+1).

Example: add entry 8765 to the end of list 4356

```
draddm 4356 8765 -1
```

DRDELMEMBER—Delete a Member From a List

This command deletes a member from a list in the directory.

The parameters are

List ClientID

The clientID of the list from which the member is to be deleted. The default is the last list accessed.

Member ClientID

The clientID of the member to delete.

Example: delete member 8765 from list 4356

drdelmem 4356 8765

DRCLIENTID—Allocate a New ClientID

A new clientID is allocated by the server and it is displayed. There are no parameters.

DRLOCKENTRY—Lock an Entry for Update

The specified entry is locked to prevent any other task from updating it. If the entry is already locked by another task and that task is still alive, this operation will fail.

Note: It is not necessary to lock an entry before updating it, however proper locking and unlocking of entries can avoid inconsistencies resulting from two clients trying to update the same entry at the same time.

The parameter is

term clientID

The clientID of the entry to lock.

DRUNLOCKENTRY—Release the Update Lock on an Entry

The specified entry is unlocked to allow other client tasks to update it.

The parameter is

clientID

The clientID of the entry to unlock.

Utility commands

DRPRIME—Create a New, Empty Directory File Structure

Before a DRSERVER can be successfully brought up, certain files must be created on disk. This command creates an empty directory according to various parameters. If a directory already exists, the user is given the option of deleting it or renaming it (thereby keeping it for possible future use). If the server is currently running using the old directory, it must be restarted (using DRCONTROL) to force it to recognize the new directory.

The priming algorithm attempts to predict what the distribution of data will be in the directory, and sets up the files so that the directory will not be too unbalanced with this distribution of data. When the auditor runs, it will rebalance the files based on the actual data entered into the directory. However, if the parameters entered are vastly different from the data entered, it may take a lot of auditing before the directory is fully rebalanced.

When the hospitality feature is installed, directory audits are disabled since the frequency of changes makes it pointless and the prohibition of updates while auditing is unacceptable. This makes it especially important that the priming algorithm accurately predict the distribution of data. A special algorithm is activated for hotels by passing in a negative value for the number of entries.

Priming a new directory involves creating some cabinets and many (possibly hundreds of) secondary index files. This may take some time. A counter of the number of secondary index files created so far is displayed on the bottom line of the console so that the progress of the operation can be monitored.

The parameters (all of which have reasonable defaults) are as follows:

Number of Entries

An estimate of the number of entries which will be added (negative for hotels).

Percentage of Users

The percentage of entries which are Meridian Mail users.

Expected Common DN Prefix

Expected Percentage Having this Prefix

These two prompts together are used to enter a list of up to 5 DN prefixes (e.g., area codes) to make directory priming reflect DN usage. This is useful in central office systems where the full network DN, including the area code, is used. It is also useful in the situation where many users from another site are added to the directory. Typically, all these entries will have the same dialling prefix—this will result in an uneven distribution of DNs and possibly a seriously unbalanced directory.

The percentage is used to indicate the expected use of each DN. If the list has less than 5 DNs, use 0% to terminate the list. The percentages must add up to 100.

Default Country

The most common country for entries. Space is saved in the directory by only storing the country if it differs from the default.

System ID

A number uniquely identifying this system. This is used to prevent two systems from allocating the same clientIDs.

Default Domain

The most common domain ID for entries (saves space).

Default Organization

The most common organization ID for entries (saves space).

Lowest ClientID

The expected lowest clientID in the directory. If many entries are going to be added with predefined clientIDs, this allows the priming to take into account the range of expected clientIDs.

First New ClientID

The serial number of the first new clientID to allocate.

Last ClientID

The serial number of the last new clientID to allocate.

Server Number

The number of the directory to prime for. The default is 0, but 1, 2, or 3 may be specified for alternative directories.

Path to Create Directory Under

Where in the file system directory structure the empty directory should be created. Normally this is the root cabinet of the system volume (/1).

DRAUDITPARMS—Set Parameters Controlling Audit

This command allows various parameters that control the DR audit to be conveniently updated. All of these parameters can be set through the DRCONTROL command, but DRAUDITPARMS is much easier to use.

The parameters are

Suppress Auto Audit

Enter Y to disable automatic nightly auditing.

Audit Time (Hr)

The local time to run automatic audit (24 hour clock).

Audit Time (Min)

The minute part of the automatic audit time.

Audit Time Limit (Hrs)

The maximum length of time to run one audit (hours).

Audit Time Limit (Min)

The minute part of the audit time limit.

Audit Advice

The set of parameters controlling the audit.

Note: All parameters default to current settings.

See the DRGETOMS command for a description of these parameters. To make parameters permanent, type “Y”. The parameters are saved on disk so that they will apply to all future audits. Type “N” if the parameters are to apply only to the next audit. In this case, they will be lost if the server is restarted.

DRUPDPARMS—Update Directory Parameters and Stats

Various configuration parameters and statistics are stored in the primary index file of a directory. This command provides a means of updating those parameters if necessary.

There are many parameters which are prompted for individually. The meanings of the parameters are given under the descriptions of commands DRPRIME, DRAUDITPARMS and DRGETOMS.

DRCONTROL—Issue a Control Request to the Server

This command invokes the control entry of the DRSERVER and passes it a control command. Various server parameters can be set using this command. The setting is temporary (not stored on disk) unless a save request is issued.

Note: Audit parameters can be more conveniently set using the DRAUDITPARMS command.

There are two parameters: the control request and the server number. The server number is the second argument and ranges from 0 to 3, with 0 being the default. If the server number is not entered, the default server number (0) is assumed. Possible control request values are

shutDown

The server is terminated gracefully.

kill

The server is aborted immediately.

save

The server saves its current state.

restart

The server restarts as though it had been rerun.

sanity

The control entry is invoked, but no action is performed.

audit

An audit is begun.

auditStop

If an audit is running, it is terminated gracefully. There may be a delay until the audit can be safely stopped.

disableUpdates

Updates are disabled and the memory used by the update agent is freed.

enableUpdates

Updates are reenabled.

reInitUpdAgent

The update agent is killed immediately and restarted. This allows simulating crashes during updates and allows testing the recovery logic.

auditWait

If an audit is running, wait until it is complete.

auditHr+1

Increment the time an automatic audit will start by one hour.

auditMin+1

Increment the automatic audit start time by one minute.

autoAuditOnOff

If automatic auditing is enabled, disable it. If automatic auditing is disabled, enable it.

pauseOnOff

All server activity (retrievals, updates, audits) can be temporarily stopped. This request toggles the pause state on and off.

noUnder

Turn off the underFill audit option.

under

Turn on the underFill audit option.

noShrink

Turn off the shrink audit option.

shrink

Turn on the shrink audit option.

reBalance

Enable file rebalancing during audit.

noRebalance

Disable file rebalancing during audit.

compact

Enable compacting of fragmented files during audit.

noCompact

Disable compacting of fragmented files during audit.

noOver

Turn off the overFill audit option.

over

Turn on the overFill audit option.

limHr+1

Increment the audit time limit by 1 hour.

limMin+1

Increment the audit time limit by 1 minute.

DRTIMES—Display Time Measurements on DR Functions

Md_dr commands are implemented by calls to procedures in unit DR_PROCS. Md_dr provides a timing facility to monitor the performance of these procedures. For each function which has been called, this command displays the number of calls, the average time in milliseconds, the minimum time in milliseconds, and the maximum time in milliseconds. Timing uses a precision of 10 milliseconds.

The optional parameter is

reset

If parameter value reset is inputted on the command line, the counts and times are reset to zero after the current values are displayed.

Commands that are useful in Execs

These commands can also be used interactively but are provided primarily to facilitate the writing of powerful execs. See the section entitled “Sample Execs” for examples of md_dr execs. For details on writing execs see the *CLI User Manual and Programmer’s Guide*.

Note: Md_dr (and DR_PKG) turns off the INTERACTIVE flag of CLI.

DRCURRENTY—Set, Display or Return the Current Entry

If no parameters are provided on the command line, this command displays the current entry. If the DRLINEENTRY flag is set, the entry data is returned in the result string from the command. If parameters are provided on the command line, they are parsed as the field values to be set into the current entry (See the section entitled “Directory Entries” for the order and values of entry fields).

Note: This does not update the directory—it just updates the md_dr currEntry variable in memory. To update the directory, a directory update command must be issued—currEntry can be used to supply the new entry data.

Example: set a CLI variable to line representation of entry

```
let s = @DRCURRENTY
```

DRCURRMATCH—Return Current Value of Match Variable

The match value returned from the last retrieval is stored in a global variable in md_dr. This command returns its value: “nomatch”, “singlematch”, or “multimatch”.

There are no parameters.

DRKEYTYPE—Return Key Type of CurrEntry

Every entry is indexed under a particular type of key. When an entry is retrieved, the key type under which it was indexed is available in the entry, but is not usually displayed. Sometimes the key type is useful to control the display of other fields. This command returns the key type under which CurrEntry was indexed.

A complete list of keyType values is defined in the DR software. A few of the more useful ones are

- 0 - listMember
- 1 - clientID
- 2 - userID
- 3 - BoxNumber
- 4 - DN
- 5 - Surname
- 7 - Dept
- 12 - GivName
- 13 - Entry Type
- 14 - Soundex
- 17 - BoxAddress
- 20 - Secondary DN
- 21 - Third DN
- 52 - Volume ID

DRNUMENTRIES—Return Total Number of Entries

This command returns the total number of entries (in all categories) currently in the directory.

There are no parameters.

DRATTRGET—Return Value of an Attribute of CurrEntry

This command returns the value (in string form) of a specified field in the current entry. It can be used in execs to test a field value.

The parameter is

Attribute

The name of the attribute to return.

DRATTRSET—Set Value of an Attribute of CurrEntry

This command allows one field of the current entry to be set to a supplied value. It can be used in execs to update entries.

Note: This does not actually update the directory—only the currEntry variable in md_dr is updated. To update the directory, a directory update command must be used—currEntry can be used as the new entry value.

Parameters are

Attribute

The name of the attribute to set.

Attribute Value

The new value of the specified attribute.

DRVALIDATE—Check CurrEntry Against Specified Value

This command compares all the fields of the md_dr currEntry variable against the value of the entry whose fields are provided on the command line or as responses to prompts. The return string is null if the entries match, and 0 if there is a mismatch. This command is useful in test execs to check whether the correct entry has been retrieved.

The parameters are as described in the section entitled “Directory Entries”.

Example: ensure currEntry is as expected

drv persnu,john,smith,j

DRETMATCH—Match CurrEntry With Entry Type Pattern

The entry type field of the currEntry variable is matched using a specified entry type pattern. If the pattern matches, 1 is returned; if it does not match, 0 is returned.

The parameter is

Entry Type Pattern

The entry type pattern to match currEntry against. See section entitled “Pattern Fields” for a description of available patterns.

Example:

```
if (@DRETMATCH(persModl)) then
  writeln its a person or a model
else
  writeln its something else
endif
```

DRLEADER—Set String to Prepend to Certain Output

If the DRMULTIFIND command is used to display entries when the DRLINEENTRY flag is set (and DRCOLUMN is off), the format of the output is acceptable input for commands DRADDDENTRY and DRCHGENTRY. One way to dump a directory is to use TEE to capture the output of a DRMULTIFIND command in a file. (Type help tee for more information.)

This data can then be reloaded into a directory (perhaps after repriming an empty one) by running the output file as an exec. This can be done by using the DRLEADER command to prefix each line output by DRMULTIFIND with a specified leader string—typically a command name or alias (such as “dra”).

Output from the DRMULTIXPAND command is also prefixed with the leader string to allow it to be used to reload the contents of a list.

The parameter is

Leader

a string to be prepended.

Note: This will usually require a trailing space.

Example:

```
drleader dra
```

DRERROR—Set Which Errors to Ignore In Execs

If the DRERREXIT flag is set, and an error occurs in an exec, the exec is normally terminated. Sometimes certain minor errors are expected and it is desired that the exec continues. This command allows specification of the errors to ignore. Execs can, therefore, avoid implementing complex error handling logic.

All errors are initially enabled. If no parameters are provided on the command line, the current error codes to ignore are displayed.

Otherwise the parameters are:

Error ON or OFF

Type OFF if specifying error codes to be ignored. Type ON if specifying error codes to be reenabled.

Error Codes

A list of error codes whose state is to be changed.

Example: disable exiting from execs for two error codes
drerror off 3175 3184

Global commands

Several commands are provided which will perform operations on a subset of the entries in the directory. The entries on which to operate are specified using either a simple or full pattern (as in `DRMULTIFIND`). If a nil pattern is given, the operation will be performed on all entries.

The progress of a global operation is indicated by a display on the bottom line of the console which gives the number of operations performed, the number of errors and the clientID, and name of the entry on which the current operation is being performed.

None of these commands require an open DRCB—they all use private DRCBs allocated from the `md_dr` heap for the duration of the command.

All of the global commands have a parameter `error action` which controls how errors are to be handled. Possible values of error action are `continueIfError` (continue the global operation even if a minor error is encountered—it will stop if a major error occurs); `stopOnError` (stop the global operation if any error is encountered); `verify` (perform retrievals after the operation is complete to check that it has been performed successfully).

DRCHK—Perform Consistency Check on Some Entries

This command attempts to retrieve entries by all the keys under which they should be indexed and ensures that the same data is returned from each retrieval.

Lists that the entry should be a member of are also checked. Correct entry ordering is also checked.

Any inconsistencies result in SEER reports. This command checks only the main (default) directory. It does not check a second directory.

The parameters are

Pattern

Either a simple or full pattern as in `DRMULTIFIND`.

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Example: check all users

```
drchk s enttype user st
```

DRDELETE—Delete Some Entries

The specified entries are deleted from the directory.

The parameters are

Pattern

Either a simple or full pattern as in DRMULTIFIND.

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Example: delete all entries from a location

```
drdelet s loc miami cont
```

DRCHANGE—Change an Attribute in Some Entries

The value of an attribute is changed to a given value in all entries matching a pattern.

The parameters are

Pattern

Either a simple or full pattern as in DRMULTIFIND.

Attribute to Change

The name of the field to change.

New Value

The new field value.

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Example: reenable disabled voice users

```
drchang s vcls disabled vcls enabled st
```

DRLISTADD—Add Some Entries to a List

The entries matching the specified pattern are added to a list at a given position.

The parameters are

Pattern

Either a simple or full pattern as in DRMULTIFIND.

List ClientID

The clientID of the list to which the members should be added.

After Member Number

Where in the list to add members (see DRADDMEMBER)

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Example: make a departmental distribution list

```
draddent list Dept 2S 2525
```

```
drlistadd s dep 2s+ * -1 st
```

DRLISTDEL—Delete Some Entries from a List

The members of a specified list which match the given pattern are deleted from the list.

The parameters are

Pattern

Either a simple or full pattern as in DRMULTIFIND.

List ClientID

The clientID of the list from which members are deleted.

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Example: delete members from a list based on department.

```
drlistdel s dep 2s3+ * st
```

DRLISTMERGE—Add Members of One List to Another List

The members of one list are added to another list at a specified position.

The parameters are

Source List ClientID

The clientID of the list where members are to be taken.

Destination List ClientID

The clientID of the list where members are to be added.

After Member Number

Where in the list to add members (see DRADDMEMBER)

Error Action

How to handle errors (see the introduction of the present subsection, “Global commands.”)

Flags

CLI provides a facility for packages to define flags. Flags are on/off switches to control the operation of the commands in the package. The state of all flags can be displayed using the CLI FLAGS command. The state of an individual flag can be displayed by typing the name of the flag. The state of a flag can be changed by typing the name of the flag, followed by ON or OFF. Md_dr defines the following flags:

DRQUIET—Suppress Certain Output

When set, this flag suppresses the following output (mainly in order to facilitate dump and reload data capture):

- the counts of the numbers of entries retrieved by DRMULTIFIND and DRMULTIXPAND.
- the value of a retrieved entry (unless the DRLINEENTRY flag is on).
- operational measurements from DRGETOMS
- in the DRMULTIXPAND command, only the clientID of the member is displayed (with leader if any)
- any prompting for input of entry attributes is suppressed—the defaults are used

The default is OFF.

DRLINEENTRY—Display Entries in Single Line Format

If this flag is OFF, the fields of an entry are displayed one per line, with a label indicating the different fields. Only fields that have non-nil data are displayed.

If this flag is ON, the fields of an entry are ordered in a single line with commas separating field values. Field values are surrounded by quotes if required. Nil fields are not output; commas are used as place holders.

This format allows all the data in an entry to be displayed concisely. The format is valid input to the routines which parse entry data. One problem is that strings are limited to 255 bytes. In the rare case that an entry has more than 255 bytes of data in its fields, the excess data will be lost.

Note: The DRCOLUMN flag changes the single line entry format.

The default is OFF.

DRCOLUMN—Display in Single Line, Column Format

This flag is only effective if the DRLINEENTRY flag is also enabled. If both flags are turned on, entries will be displayed in a columnar format which is easier to read, although it lacks all of the entry fields.

The fields displayed are surname, given name, initials, department, location and phone number.

This format also has the advantage of faster display—the other formats can slow the apparent retrieval rate.

The default is OFF.

DRERREXIT—Exit Execs On an Error

If this flag is on, any error (except those disabled by DRERROR) returned from a DR function during an exec will cause the exec to terminate. If the flag is off, errors will not cause exec termination.

The default is ON.

DRBACKWARDS—Reverse Order of MultiFind, MultiXpand

If this flag is on, DRMULTIFIND retrievals will be in *descending* order and DRMULTIXPAND displays starting at the *end* of a list.

The default is OFF.

Dump-Reload utility commands

Sometimes it is necessary to rebuild a directory due to file corruption or file format changes. You can rebuild a directory using an online (system active) or offline (system down) procedure. These two procedures are available using an optional package (DRFIX_PKG.CODE) which can be loaded into a running md_dr program. Before using either procedure you should first do a backup of VS1 which contains the organization directory. See the “General Administration” chapter in the *System Administration Guide* for details on backup procedures.

The online rebuild procedure uses the commands DRONLINERELOAD and DRSWITCHDIRS. This online rebuild procedure creates a second directory and copies entries from the main directory to the second directory. The second directory is completely independent of the main directory and the procedure can be safely run and rerun on an active system.

An +R option can be specified to reconstruct missing entries in the second directory by scanning the system. Once the second directory is populated, it can replace the main directory.

The offline rebuild procedure uses the commands DRDUMPDIR and DRRELOADDIR. This offline rebuild procedure dumps the directory into a file and reloads the directory from the file. The system must be offline as the directory is being reloaded.

In most cases, the online procedure would be preferred since it minimizes service impact. However, it does require enough disk space for a complete copy of the directory and enough memory for a second directory server to run. On small systems, the offline version may be the only alternative.

DRONLINERELOAD [+R]—Copy entries to a second directory

DRONLINERELOAD creates a second directory and copies entries from the main directory to the second directory. All other system operations go to the main directory, so Meridian Mail is unaffected. This command can be time consuming since it takes roughly 6 seconds per directory entry. The entire reload could take many hours.

The reload can be done with a +R option. If the +R option is specified, the reload will attempt to reconstruct entries that it could not find in the main directory. Reconstructed entries will be usable but not as complete as the originals.

Before running this command, turn on auto printing (press Ctrl-W, then press P) so that the output from this command can be captured on paper.

System administration such as adding or changing users cannot be performed during the online reload since the directory updates are dislocated.

The command first tries various keys to determine which key will retrieve the greatest number of entries. A check is then done for available disk space on VS1 for the second directory. If VS1 is too full, the utility exits. Space needs to be freed before rerunning the command, or the offline DR dump and reload can be used instead.

Next, you are prompted for the number of entries for priming when the new second directory is created. By default, this is based on the priming rules used upon system installation. For hospitality systems only, ensure that the number of entries for priming is negative. This is important since hospitality systems place a different load on the directory.

Actual values to use for priming depend on the system configuration. The following tables indicates values used upon installation.

Table 9-2
Number of entries for different CPE platforms

Platform	No. of Entries
Card Option	200
CPE 1 node	1 500
CPE 2 node	3 500
CPE 3 node	5 500
CPE 4 node	7 500
CPE 5 node	9 500

Table 9-3
Number of entries for SPM or MSM platforms based on number of voice nodes

SPM or MSM	No. of Entries
1 voice node	6 000
2 voice node	12 000
3 voice node	18 000
4 voice node	24 000
5 voice node	30 000
6 voice node	36 000
7 voice node	42 000
8 voice node	48 000

After the prompt, the utility proceeds to start the second directory server, add entries to the second directory from the first.

Note: If the +R option was specified, the utility will then proceed to scan various system cabinets and profiles to reconstruct missing entries (which are added to the second server.) Reconstructed entries are

- local voice users
- customer groups with their broadcast mailbox
- classes of service
- voice services with service definition files (MS, AS, FI, VF, TD, TS)

All other entries cannot be reconstructed. Some data is also lost with reconstructed entries including name information, departments, and secondary and tertiary DNs.

The utility will then update system distribution lists on the second directory. At the end, it will report any discrepancies between the main directory and the second directory. SEERs with SEER number 3171 indicate when the utility starts and stops and will report any errors.

In summary, on non-hospitality systems, the procedure is

- 1 Run DRONLINERELOAD from md_dr with DRFIX_PKG loaded.
- 2 Once satisfied with the results, run DRSWITCHDIRS.

On hospitality systems, the PMSI link must be in bypass mode during the reload. The procedure for hospitality is

- 1 Place the PMSI link in bypass mode.
- 2 Run DRONLINERELOAD from md_dr with DRFIX_PKG loaded.
- 3 Once satisfied with the results, run DRSWITCHDIRS.
- 4 Place the PMSI link back in service.
- 5 Place Meridian Mail in room resynchronization mode.
- 6 Perform a database swap.
- 7 Take Meridian Mail out of room resynchronization mode.

ATTENTION

In hospitality systems if a guest is checked out and another checked in to the same room before the database swap has completed (that is, during steps 2 to 6), the later guest will hear the previous guest's messages.

If errors have been encountered, DRONLINERELOAD can be rerun safely. It will remove the second directory that was previously created, and rebuild the second directory from the beginning.

Once you are satisfied that the second directory has been created and datafilled successfully, proceed to DRSWITCHDIRS.

DRSWITCHDIRS—Replace directory with second directory

DRSWITCHDIRS moves the main directory aside, installs the second directory created with DRONLINERELOAD into its place, and restarts the main directory server to access the new directory. This whole procedure only takes a few seconds.

If you have turned off auto print after you ran DRONLINERELOAD, then turn the auto printing back on (press Ctrl-W, then press P) so that the output from this command can be captured on paper.

After the directory switch, you are asked whether you wish to remove the old directory. This will free up disk space on VS1 and is recommended. If you do wish to keep the old directory, it is kept in the cabinet /1/dr.save and can be removed using a utility such as MD at a later time.

It is not recommended to manually re-install the saved directory. The purpose of saving it would be primarily for later inspection to determine the causes of whatever problems have occurred. However, if the saved directory is to be re-installed, the steps to return the system to its state just before DRSWITCHDIRS was run would be

- 1 fork md_dr and load MD
- 2 drcontrol disableUpdates
- 3 mv /1/dr /1/dr.2/dr
- 4 mv /1/dr.save /1/dr
- 5 mv /1/dr.2/dr/details /1/dr/details
- 6 drcontrol restart
- 7 drcontrol enableUpdates

DRDUMPDIR—Dump Entries to a File

This command attempts to retrieve all entries and lists from an existing directory and stores the information in a specified MISA file. In order to recover the directory in spite of possible file corruption, the entries are retrieved by several keys and then dumped based on whichever key retrieved the most entries. Lists are expanded to get their members. The command terminates if more than 20% of the entries cannot be retrieved or if there is insufficient disk space for the dump file.

The only parameter is

Dump File Path

This is a MISA file path. If the specified file exists, it will be overwritten. Otherwise, it is created.

DRRELOADDIR—Recreate and Reload Directory

This command removes the existing directory, recreates a new one by priming, restarts the server, adds back entries from the dump file, and adds members back into system distribution lists. It is time-consuming (about 6 seconds are required per entry.)

ATTENTION

The dump file is erased after the reload operation completes successfully—the MD utility can be used to copy it if a backup copy is desired.

Restriction: Reload may not work correctly if the manager-employee or service-contact relationships have been used since there is no guarantee that the manager entry will have been added before the employee entries that refer to it. These relationships are not used in Meridian Mail.

The parameters are

Dump File Path

This is the pathname of a MISA file into which the directory was previously dumped.

Number of Expected Entries for Priming

This should be set according to the number of entries the directory will hold. The default is twice the number of entries dumped. See Table 9-2 or Table 9-3 in the section “DRONLINERELOAD” for the values to use.

Example: dump and reload a directory using volume 202 for the dump file and priming for 2000 entries:

```
drdumpdir /202/drdumpfile
drreloadaddir /202/drdumpfile 2000
```

Exceptional directory manipulations

Creating a new directory

A new, empty directory is created by the DRPRIME command. The DRSERVER will not start up unless a directory file structure exists on the system volume. The procedure for creating such a structure is

- 1 Run md_dr
- 2 Execute the DRPRIME command, answering the prompts as accurately as possible (the defaults are usable in some cases).
- 3 Once the DRPRIME command has completed, start up the DRSERVER.

Note: This procedure does not create the directory in the initial state required for a Meridian Mail system which expects certain entries to already be in the directory.

Switching directories

It is possible to keep several directories on the same system volume. Use the MD (Misa Driver) utility to view the files on the system volume (/1). MD can either be run as a standalone program or can be loaded dynamically from md_dr using the command load MD.AREA. Use the following steps:

- 1 Run MD
- 2 cd /1
- 3 ls
- 4 mv dr <save name>—this saves the old directory under “save name”
- 5 From the listing of cabinets choose one corresponding to the directory to which you wish to switch.
- 6 mv <new dir> dr
- 7 If the DRSERVER is already running, use the md_dr DRCONTROL command to restart it. If the DRSERVER is not running, start it up.

Copying directories

A copy can be made of a directory on the same or a different volume by the following procedure:

- 1 run MD
- 2 cd /1
- 3 cp dr <new name>—this can take some time
- 4 Switch to the new directory (see previous section) and start a DRSERVER.
- 5 Run md_dr.
- 6 Use DRAUDITPARMS to set audit advice to noRebalance.
- 7 Use DRCONTROL to start a DR audit.
- 8 Wait until audit is completed (watch for SEER).

It is necessary to run a DR audit since the primary index file contains FIDs of the secondary index files. Copying the directory changes these FIDs, therefore the primary index must be rebuilt using an audit.

Dump and reload procedure

A loadable package (DRFIX_PKG) is available to perform automated dump and reload operations. This package is much faster and less error-prone than the techniques described below.

If DRFIX_PKG cannot be used, an exec-based method can still be used. This is possible by dumping the contents of the directory to a text file using the DRMULTIFIND command with an appropriate leader, then creating a new directory and running the text file as an exec to add in the previous contents. The procedure is complicated by several factors:

- 1 There is no way to dump the detail file contents to text file (especially the spoken names).
- 2 List contents also have to be dumped and reloaded.
- 3 Manager and Contact relationships constrain the load order.

The execs `dumpdrinto` and `reloadfrom` in the sections entitled “Exec to dump Directory Into File” and “Exec to Reload Directory from a File” will perform a dump and reload assuming there are no manager or contact relationships. If these relationships exist, it may be necessary to manually edit the dump file to reorder it so that no employee is added before the corresponding manager. The procedure for dump and reload is:

- 1 `drget`—note the value of `lastCID`
- 2 `dumpdrinto <filename>`
- 3 Use `DRPRIME` to reprime the directory as required. Use the value noted for `lastCID` as the value for the first new `clientID` to give out value.
- 4 `reloadfrom <filename>`

Error codes

In keeping with system conventions, DR error codes are in the range 3100 to 3199.

File system errors

In some cases md_dr operations may fail due to lower level file system errors. A few of the more common file system errors are described here; consult the appropriate documentation for more detailed information.

1000

Insufficient Memory to Open a File (DD)

1101

VS Tasking Error—Volume Server Died (VS)

1103

Volume Full—DR will not attempt an update if space is low (VS)

1105

Volume Server Not Found

1106

Access Mode Conflict (two tasks trying to write the same file)

1224

File Not Found (CM)

Serious DR errors

The above file system errors are also considered serious. In the event of a serious error, a SEER is generated and the DRCB is closed.

3101

Primary Index File Too Short (Corrupted Directory)

3102

Primary Index File Too Short (Corrupted Directory)

3105

Server Could Not Allocate New Segment

3106

Insufficient Memory for Server Segment

3107

Unable to Initiate Update Agent

3109

Error Performing Control Function

3116

A File System Error Occurred—Check File System Error Code

3117

Missing Continuation File (Directory Corruption)

3118

Update agent unable to pull entry

3119

Unable to push DR OMs back to client

3122

Consistency Check—KeyRegenerate Filter Reject

3123

Consistency Check—KeyRegenerate Bad Language (this can happen if a language module has been installed then removed)

3124

Consistency Check—KeyRegenerate Bad KeyType

3126

Consistency Check—Entry Without ClientID

3127

Consistency Check—Out Of Order Key

3130

DRCB Already in Use

3131

Insufficient Memory to Open DRCB (Try recovering some space)

3132

Attempt to Use an Invalid DRCB (Try using DROPNOD command)

3134

DR Server Could Not Be Accessed (Try starting it)

3135

Update Agent Not Available—Either Auditing or Updates Disabled.

3138

Secondary Index File Not Found

- 3139**
Secondary Index File Too Short
- 3140**
Corrupt Secondary Index File
- 3141**
Corrupt Secondary Index File
- 3142**
Corrupt Secondary Index File
- 3143**
Corrupt Secondary Index File
- 3144**
Corrupt Secondary Index File
- 3145**
Corrupt Secondary Index File
- 3146**
Corrupt Secondary Index File
- 3147**
Corrupt Secondary Index File
- 3148**
Corrupt Secondary Index File
- 3149**
Corrupt Secondary Index File
- 3150**
Corrupt Secondary Index File
- 3151**
Corrupt Secondary Index File
- 3152**
Corrupt Secondary Index File
- 3153**
Corrupt Secondary Index File
- 3154**
Corrupt Secondary Index File

3155

Invalid DN field in dr_COS entry

3158

Consistency Error—Attempt to Skip List

3159

Consistency Error—Could Not Make Key

3160

Consistency Error—Could Not Make Key

3161

Consistency Error—Could Not Make Key

3164

Entry Is Not Properly Retrievable Under a Key

3165

Invalid parameters passed

3166

Entry Is Not Properly Referenced

3167

Entry Retrieved Twice

3168

Entry Is Not Properly in a List

Minor DR errors

These errors usually indicate an error using the system. The DRCB is not invalidated and may continue to be used.

3170

Language Unknown—Attempt to Set Unknown Language

3171

Status and errors from DRONLINERELOAD/DRSWITCHDIRS

3172

Bad Pattern—Use of ? In Invalid Place, or unspecified siteID and/or locationID in a BoxAddress retrieval

3173

DRCB locked—Two tasks using same DRCB at the same time

3174

Max Cost Advice Exceeded—Pattern Too Loose?

3175

Attempt to Add an Entry to a List Twice

3176

Bad Call Sequence—Called NextEntry with No Scan Active

3177

Bad Call Sequence—Called PrevEntry with No Scan Active

3178

Bad Call Sequence—Called LastEntry with No Scan Active

3179

Bad Call Sequence—Called NextReferrer without Scan Active

3180

Invalid Data in An Entry during Add or Change. May be caused by garbage characters in a field or by attempting to refer to an entry which does not yet exist. Other causes are a user entry with no cabinet FID, an invalid siteID or locationID or spoken name with no detail FID.

3181

Key domain mismatch between the marker and the pattern

3182

ClientID Supplied Is Already In Use

3183

Entry Not Found

3184

Member Not Found

3185

Reached End of Directory When Deleting List

3186

Entry Not Found In DelEntry

3187

Entry Not Found In ChgEntry

3188

List Entry Not Found in AddMember or DelMember

3189

Member Entry Not Found in AddMember

3190

Entry Not Found in drReferences

3191

Attempt to Expand Non-Existent List

3192

Entry Is Not A List

3193

Invalid Entry Type in ChgEntry. It is not allowed to change a list into a non-list, or a non-list into a list.

3194

Invalid scan state to obtain a marker

3195

Attempt to Update Entry Without Locking

3196

Entry Already Locked

3197

Entry Not Yet Locked By You

3198

Cannot Lock, Lock Table is Full

3199

UnImplemented Function Called

Sample Execs

Display All Distinct Field Values

```
{md_dr exec to display all distinct values of indexed field named as parameter}  
drquiet on  
writeln ---DISTINCT VALUES OF @1 IN ORG DIR---  
dropen 1  
let oldval = ""  
drsimpfind @1 +  
loop  
if (@DRCURRMATCH=nomatch) break  
let val = @DRATTRGET{@1}  
if (@val=@oldval) goto sameval  
writeln @val  
let oldval = @val  
)sameval  
drnextentry  
endloop
```

Identify Entries With Excessive Field Lengths

```

{md_dr exec to identify entries with excessive field lengths}
drquiet on
writeln ----SEARCHING FOR ENTRIES WITH EXCESSIVE FIELD LENGTHS...
let num = 0
let bad = 0
dropen 1
drsimplfind nameTitle +
loop
if (@DRCURRMATCH=nomatch) break
let num = (@num+1)
if (@DRETMATCH(persModl)) then
  if (@SLENGTH(@DRATTRGET(surname))>41) goto entbad
  if (@SLENGTH(@DRATTRGET(title))>33) goto entbad
  if (@SLENGTH(@DRATTRGET(loc))>39) goto entbad
  if (@SLENGTH(@DRATTRGET(dept))>33) goto entbad
else
  if (@DRETMATCH(servComp)) then
    if (@SLENGTH(@DRATTRGET(surname))>41) goto entbad
    if (@SLENGTH(@DRATTRGET(loc))>39) goto entbad
  endif
  if (@DRETMATCH(serv)) then
    if (@SLENGTH(@DRATTRGET(dept))>33) goto entbad
  endif
  if (@DRETMATCH(LBC)) then
    if (@SLENGTH(@DRATTRGET(surname))>41) goto entbad
  endif
endif
goto entok
)entbad
let bad = (@bad+1)
writeln *BAD ENTRY FOUND* @DRATTRGET(givName) @DRATTRGET(surname)
@DRATTRGET(clientID) DN: @DRATTRGET(dn)
)entok
drnextentry
endloop
writeln FINISHED. CHECKED @num ENTRIES. @bad BAD ONES FOUND.----

```

Exec to Dump Directory into File

```
{md_dr exec to dump into file @1}
drlineentry on
drquiet on
drcolumn off
drbackward on
pagesize 0
drleader draa
dropen
tee open @1.exec

{retrieve all entries}
drmultifind simple surname +

{now use a second drcb to find all lists, expand each one}
dropen 2
drsimpfind enttype list
loop
  if (@DRCURRMATCH=nomatch) break
  let cid = @DRATTRGET(clientid)
  dropen 1
  drleader ( draam #@cid# )
  drmultixpand @cid
  dropen 2
  drnextentry
endloop
tee commit; tee close

{now load md so that details cabinet can be saved}
load md.area
mv /1/dr/details /1/@1dets
unload md.area
```

Exec to Reload Directory from a File

```
{md_dr exec to reload directory from file @1}
drcontrol auditwait
drcontrol restart
drcontrol auditwait
dropen
alias draa draddentry

{define an internal macro for addmember}
macro draam
draddmember @1 @2 0
endmacro

{now run the dump file as an exec}
exec @1

{now use md to patch up detail file cabinet}
load md.area
heap 100
cd /1
ddopen @1dets rw
dddestroy
rm @1dets
unload md.area
```


Programming interfaces

DR_PROCS—Basic directory routines

Types and constants used to access DR are defined in unit DR_TYPES. See the section entitled “Basic Concepts” for concepts useful in understanding the basic types defined.

Directory access is done through procedures in DR_PROCS, which map fairly closely to the commands documented in the sections entitled “Basic Commands” and “Update Commands”.

Unit DR_SOUNDX contains functions used by DR to do string handling using multi-lingual character sets and skip and stop characters. These routines are essentially independent of the directory application.

Other units are DR_TOOLS which implements the global operations and other utilities, and DR_PRIMER which implements the priming of new directories and the update of DR_SERVER parameters. New language modules can be created by modifying the off-line program DR_MAKEENGLISH.

The functions provided in unit DR_PROCS are

dr_OpenOD

Get a DRCB to access an organization directory, specifying advice.

dr_Close

Destroy a DRCB and recover the memory it used.

dr_ReOpenOD

Reinitialize DRCB and refresh its view of the system.

dr_ChgAdvice

Change the advice used by a DRCB.

dr_GetInfo

Return miscellaneous DRCB or DR information.

dr_FindEntry

Start a retrieval using a pattern.

dr_SimpFind

Start a retrieval using a single pattern field.

dr_ContScan

Continue a retrieval using a pattern and a marker

dr_GetMarker

Mark a place in a retrieval so the retrieval can be continued later using dr_ContScan.

dr_ExpandMembers

Start a list expansion.

dr_NextEntry

Continue an active multi-match retrieval or list expansion.

dr_PrevEntry

Go back one entry in a retrieval or list expansion.

dr_LastEntry

Go to the last entry in a retrieval or list expansion.

dr_ScanGoTo

Go to specified position in a retrieval or list expansion.

dr_References

Start retrieving clientIDs of entries referring to an entry.

dr_NextReferrer

Continue retrieving entries referring to an entry.

dr_LockEntry

Prevent other tasks from updating an entry.

dr_UnlockEntry

Release a lock taken on an entry.

dr_GetDetailVol

Determine volumeID where detail files are stored.

dr_AddEntry

Add a new entry to the directory.

dr_DelEntry

Delete an existing entry from the directory.

dr_ChgEntry

Change an existing entry in the directory.

dr_AddMember

Add an existing entry to an existing list.

dr_DelMember

Remove a member from a list.

dr_NilEntry

Set an entry to a nil value.

dr_NilPattern

Set a pattern to a value matching all entries.

dr_GetOMs

Get operational measurements and info from DR_SERVER.

dr_Control

Perform DR_SERVER control function.

dr_ETMatch

Determine if an entry-type pattern matches an entry.

dr_AtApplicable

Determine if an attribute is applicable for a type of entry.

dr_AtInfo

Get information about an attribute.

dr_NewClientID

Allocate a new, unique clientID.

dr_ParseName

Break a name down into the four components maintained by the directory.

Md_dr—Directory I/O utilities

Md_dr, as well as being a CLI package, is a BNR Pascal Unit that has an interface with useful procedures for building interactive programs which display and input directory information. The actual directory operations are provided by unit DR_PROCS. Some of the functions provided by md_dr are

quoteAString

If a string needs quotes, enclose it in single quotes.

unQuoteAString

If a string is quoted, take off the quotes.

strToEnum

Interpret a string as an enumerated type value.

setToStr

Convert a set (up to 16 elements) to string representation.

CIDToStr

Convert a clientID to string (handling NIL).

FIDToStr

Convert a FID to string (handling NIL).

strToSet

Interpret a string as a set.

map255into95

Map domain of 255 values into range of 95 values.

map95into255

Map domain of 95 values into range of 255 values.

parseCID

Parse a clientID.

parseFID

Parse a FID.

parsePNum

Parse a pattern number.

inLSToLS

Convert login status input to pattern.

LSToInLS

Convert login status pattern for output.

parseET

Parse an entry type value.

parseETPat

Parse an entry type pattern value.

dispCID

Display a clientID.

getAttr

Get attribute value from entry.

putAttr

Set attribute value into entry.

parseAtNum

Parse an attribute number.

countryToStr

Convert a country to a string.

nilPatField

Return nil value for a patField.

boxAd2String

Convert BoxAddress to string.

str2BoxAddress

Convert string to BoxAddress.

parseBoxAddress

Parse a box address.

parseCountry

Parse a country.

parseSet

Parse a set.

parsePField

Parse a patField.

parseAttr

Parse an attribute.

parseEnt

Parse an entry, or convert from string form.

parsePattern

Parse a pattern.

parseAdvice

Parse advice.

attrToStr

Convert an attribute to string.

dispEnt

Display an entry, or convert to string form.

dispOMs

Display a DR OM record.

chk

Check error code and set return string.

getPattern

Parse either a simple or full pattern.

startProgressCount

Start progress display.

stopProgressCount

Stop progress display.

Command summary

Table 9-4

Md_dr command summary

Command	Parameters	Usage
DRADDEENTRY	<entType><givName><surname> <initials><DN><dept><loc><cid> ...	add a new entry
DRADDMEMBER	<listClientID><memClientID> <afterMemNum>	add a member to a list
DRADVICE		change DRCB advice
DRATTRGET	<attr>	return value of an attribute of current entry buffer
DRATTRSET	<attr><val>	set value of an attribute into current entry buffer
DRAUDITPARMS	<noAuto?><hr><min><limHr> <limMin><adv><perm?>	set audit parameters
DRCHANGE	<patType><pat><val><at><val> <errActn>	change entries matching a pattern
DRCHGENTRY	<entType><givName><surname> <initials><DN><dept><loc><cid> ...	change an existing entry in the directory
DRCHK	<pat><val><errActn>	check consistency of Org Dir entries
DRCLIENTID		allocate new clientID
DRCLOSE	<DRCB#>	close a DRCB
DRCONTROL	<request> <server>	perform server control function
DRCONTSCAN	<pattern type> <pattern>	continue a retrieval from marked place
DRCURRENTY		set, display, or return current entry
DRCURRMATCH		return nomatch, singlematch, or multimatch from last retrieval
DRDELEENTRY	<clientID>	delete an entry
DRDELETE	<patType><pat><val><errActn>	delete entries matching a pattern
DRDELMEMBER	<listClientID><memClientID>	delete a member from a list
– continued –		

Table 9-4 (continued)
Md_dr command summary

Command	Parameters	Usage
DRDUMPDIR	<path>	dump directory into a file (DRFIX_PKG)
DRDOMAIN	<domain>	set current domain mode
DRDUMPFIDEF		dump current input file description
DRERROR	<on off><errCode><errCode>...	disable or enable errors
DRETMATCH		does currEntry match an entry type pattern?
DRFINDENTRY	<nameTitle><dept><locn><dn> <box#><userID><entType>...	begin retrieval
DRGETMARKER		mark the current place in a sequential retrieval
DRGETOMS	<NORESET reset> <server>	display server operational measurements
DRINFO		get Org Dir information
DRKEYTYPE		return value of keyType field of currEntry
DRLASTENTRY		retrieve last entry in multi-match or list expansion
DRLEADER	<outputLeader>	specify string to prepend on line entry output
DRLINETYPE	<opFlag><col><len><code> <entType><code><entType>...	define input lines
DRLISTADD	<patType><pat><val><listCID> <afterMemNum><errActn>	add entries to list
DRLISTDEL	<patType><pat><val><listCID> <errActn>	delete entries from list
DRLISTMERGE	<srcListCID><destListCID> <afterMemNum><errActn>	merge two lists
DRLOCKENTRY	<clientID>	take update lock on an entry
DRMULTIFIND	<patType><pat><val>	list all entries matching a pattern
– continued –		

Table 9-4 (continued)
Md_dr command summary

Command	Parameters	Usage
DRMULTXPAND	<listClientID>	retrieve all members of a list
DRNEXTENTRY		retrieve next entry in multi-match or list expansion
DRNEXTREFERRER		retrieve next referrer in reference retrieval
DRNUMENTRIES		return current number of entries
DROPENOD	<DRCB#><options><maxCost> <language> <server>	open or set current DRCB
DRPARSENAME	<giv><sur><inits><genQual>	break name down into components
DRPREVENTRY		retrieve previous entry in multi-match or list expansion
DRPRIME	<#ents><DNPrefixList><%DNPref> <country>...	create new OrgDir
DRREFERENCES	<typeOfRef><clientID>	start retrieval of references
DRRELOADDIR	<path>	reinitialize and reload directory from file (DRFIX_PKG)
DRREOPENOD	<DRCB#>	reopen and set current DRCB
DRSCANGOTO	<clientID><index>	skip to given position in scan or list
DRSETMARKER	<clientID><key>	nil and set current marker
DRSIMPFind	<pat><val>	start a single field pattern retrieval
DRTIMES	<NORESET reset>	display function elapsed time measurements
DRUNLOCKENTRY	<clientID>	release update lock on an entry
DRUPDPARMS	<country><domID><OrgID> <SystemId><nextCID>...	change Dir parameters/statistics
DRVALIDATE	<entType><givName><surname> <initials>...	check value of currEntry
DRXPANDMEMBERS	<listClientID>	start a list expansion
– end –		

Chapter 10: Hardware maintenance (md_ma)

Meridian Mail maintenance (MA) and Meridian Mail hardware database (HD) provide a CLI-based utility called md_ma to access and manipulate the content of the hardware database. The commands in md_ma emulate the calls from other Meridian Mail application programs.

Md_ma allows users to manipulate the content of the hardware database at the HD level. HD-level access allows users to search and view component records. It also allows the users to add, delete, or modify a single component without regarding Meridian Mail configuration rules.

**CAUTION****Risk of database corruption**

Since HD allows users to modify the component (including the component type and state), it could potentially corrupt the database and make it useless for the Meridian Mail system. The user should be certain that the new component record obeys Meridian Mail configuration rules.

The Hardware Database is a MISA file that resides on the system volume (that is, /1/hwd). It contains a series of records which are called components. Each component is identified by a set of keys: state, component type, and the location code. The components are ordered by the location codes in the hardware database. The location code is made up of six bytes, each ranging from 0 to 255. Each byte represents a level in the Meridian Mail hardware structure. The actual location codes reflect the tree structure of Meridian Mail hardware.

10-2 Hardware maintenance (md_ma)

In order to aid the HD operations, a SearchKeys record and an array of component records are defined. The SearchKeys record is used by search commands. The array of component records are used in reading and writing commands.

HD operations

The HD commands allow you to view, search for, add, modify, and delete components in the hardware database. The HD commands do not check that any changes or additions you make conform to Meridian Mail configuration rules. As a result, you must be sure that the changes you make obey the Meridian Mail configuration rules. Otherwise, you may corrupt the hardware database.

Note: Some of the HD commands prompt you for parameters. These parameters can be listed on the same line as the HD command if you wish to skip the prompts. For example:

```
> HDDefKeys InService VP 1 2 5 255 255 255  
>
```

Create, Open, Close, and Dump commands

The following is a list of commands that are used to create, open, close, and dump the hardware database.

HDCreate

HdCreate creates a new hardware database on the system volume (/1/hwd) and inserts the first system record into the database. The database is closed after the file is created.

Parameters: none

HdOpen

HdOpen opens the hardware database. All commands provided by md_ma (except HDCreate) operate on an open file. HdOpen is often the first operation used when a user first starts md_ma.

Since md_ma is a CLI-based utility, [Escape] or [Ctrl] keys will cause the opened file to be closed. If either key is pressed, the user must reopen the database.

Parameters: none

HdRefresh

HdRefresh closes and reopens the database to get a more current view of the database. If the database has been modified by other programs since the user's last write access, the utility will return the appropriate message.

Parameters: none

HDClose

HDClose closes the hardware database. It should be the last command issued before a user exits md_ma.

Parameters: none

Search and Display commands

HDDefKeys

HDDefKeys defines the global SearchKeys variable in the utility. Regardless of the results of the searches, the SearchKeys variable will not be changed until the next HDDefkeys command.

Parameters: The state field (any State or a specified state), Component type (any Component or a specified component type), and the location code. For each level of the location code, 255 is a wild card that matches any number and 254 is a special number that indicates that this location level is not used.

Example (with default responses):

```
> hdddefkeys
Enter state: Any
Enter component type: Any
Enter new location.level[0]: 255
Enter new location.level[1]: 255
Enter new location.level[2]: 255
Enter new location.level[3]: 255
Enter new location.level[4]: 255
Enter new location.level[5]: 255
>
```

HDDispcomp

HDDispcomp displays all records that match the search key defined using HDDefKeys.

Parameters: none

HDDisplay

HDDisplay displays either the entire content of the hardware database, or the components specified by parameters. The components are displayed in the order in which they are stored in the file.

Parameters: Option to display all the components. If refused, then the state field (any State or a specified state), Component type (any Component or a specified component type), and the location code. For each level of the

location code, 255 is a wild card that matches any number, and 254 is a special number that indicates that this location level is not used.

HDDSPInfo

HDDSPInfo displays the contents of the DSP record in the hardware database.

Parameters: none

HDInitsearch

HDInitsearch searches for a component record in the hardware database using the SearchKeys record defined by the previous HDDefkeys command. The search will start from the beginning of the database. If a component is found, the component is retrieved, displayed, and stored in component element 0. Otherwise, a “not found” error code will be returned (3901).

Parameters: The number of matches to be found from the beginning of the database before it returns successfully. A failure to find the specified number of matches will cause the command to fail.

Example (with default responses):

```
> HDInitSearch
Enter number of matches to SearchKeys : 1
```

HDSearch

HDSearch performs the same function as HDInitsearch except that it starts its search from the current component. The current component is the component most recently accessed by the utility. A search sequence, which will set the current component position, must be started by HDInitsearch. It is possible to change the SearchKeys record between searches. A copy of the component that is found will be stored in temporary component 0 (see the section “Temporary (global) component records.”)

Parameters: The number of matches to be found from the current component position, before it returns successfully.

Example (with default responses):

```
> HDSearch
Enter number of matches to SearchKeys : 1
```

HDSysInfo

HDSysInfo displays the contents of the system component in the hardware database.

Parameters: none

HDSummary

HDSummary provides a summary of the hardware database. It provides a frequency count for each component type and further specifies within the component type the number of components in each state.

Parameters: none

Add, Modify, or Delete components

The hardware database consists of component records. These records define the nature and location of components on your Meridian Mail system, such as voice processing cards (VP), VCPort, and so on.

Temporary (global) component records

For the purpose of modifying an existing component or creating a new component, a separate set of temporary component records can be created. (These temporary components are also known as elements of a global component array.) Ten temporary components are allowed. These are numbered 0 to 9.

When you search for a component (using HDDefKeys and HDInitSearch or HDSearch), the found record is automatically placed in temporary component record 0. This copy of the component record can then be modified using HDDefine. The original component record can then be replaced by the modified temporary component record by using the HDModify command.

Similarly, you can use HDDefine to define a new component in one of the temporary component records (0 to 9). This new record can then be added to the hardware database by using the HDAdd command.

Until HDModify or HDAdd is used to incorporate one of the temporary component records into the hardware database, the temporary records have no effect on your system. Furthermore, the temporary records are erased when you quit out of the md_ma utility.

HDDefine

You can use HDDefine to create a new component or modify an existing component.

To create a new component, run HDDefine and enter the appropriate values for the new component in response to the HDDefine prompts. The prompts that appear depend on what you specify when HDDefine asks you for the component type. Later use HDAdd to add this new component to the hardware database.

To modify a component, first search for the component (use HDefkeys, then HInitSearch). A copy of the found record is automatically placed in temporary component record 0. Then run HDDefine and select temporary component 0. Because temporary component 0 is a copy of the found record, the prompts and default responses that appear when you run HDDefine correspond to the values for the found record. To create a modified version of the component, simply change the values that require changing in the temporary component record. You can later replace the original found component with the modified version located in temporary component record 0 by using the HModify command.

The first three HDDefine prompts are as follows:

Define which component (0–9) ?

Enter the temporary component record number. When modifying a component, this number is always 0.

Enter state :

The state (status) can be InService, OutOfService, or any other valid state.

Enter component type :

Enter the component type (for example, VP, VCPort, Node, and so on).

The next six prompts ask you to specify the new location for the component. When modifying a component, the default location is the location of the found component that you are trying to modify. In order for the modify process to work, the location must stay the same. Just press return to retain the same location code.

The remaining prompts, after the location code prompts, vary depending on the component type you specified. For example, if you specify a VCPort component, then the prompts that appear ask for values that are required for a VCPort component record.

Figure 10-1 shows how you would search for a component, create a modified version of the component using HDDefine, and then replace the original component with the modified version. Figure 10-2 shows an example of adding a new component using HDDefine and HDAdd.

Figure 10-1
Modifying a component

```
> hddefkeys
Enter state : OutOfService
Enter component type: VP
Enter new location.level[0]: 1
Enter new location.level[1]: 1
Enter new location.level[2]: 5
Enter new location.level[3]: 255
Enter new location.level[4]: 255
Enter new location.level[5]: 255
Enter the VP Type : 16K_NVP
>
> hdinitsearch
Enter number of matches to SearchKeys : 1
Component[0]:

LOCATION : 1 1 5 254 254 254
COMPONENT: VP STATE: OutOfService
Type NVP (16 kw) DSP Telephony Package VoiceTel Pkg
OutCall Pkg
>
> hddefine
Define which component (0-9) ? 0
Enter state: OutOfService
Enter component type: VP
Enter new location.level[0]: 1
Enter new location.level[1]: 1
Enter new location.level[2]: 5
Enter new location.level[3]: 254
Enter new location.level[4]: 254
Enter new location.level[5]: 254
Enter the VP Type : 32K_NVP
>
> hdmodify
Should the Modify be rejected if the record has changed : No
Enter component # New component: 0
>
```

Figure 10-2
Adding a component

```
> hddefine
Define which component (0–9) ? 1
Enter state: OutOfService
Enter component type: VP
Enter new location.level[0]: 2
Enter new location.level[1]: 2
Enter new location.level[2]: 5
Enter new location.level[3]: 254
Enter new location.level[4]: 254
Enter new location.level[5]: 254
Enter the VP Type : 32K_NVP
>
> hdadd
>
```

Parameters: The array element number (0 to 9), the component type, the state, and the location code. Depending on the type of the component, the user will be prompted for all the relevant fields of that component record.

HDMModify

Before running HDMModify, search for the component you wish to modify (HDDefKeys, HDInitsearch). A copy of the found component is stored in temporary component record 0. Then use HDDefine to modify the copy of the component record. Then run HDMModify to replace the original component with the modified version that is located in temporary component record 0.

The location code of the modified version of the component must match the location code of the original component. If the location codes do not match, the HDMModify command is rejected.

Furthermore, when you run HDMModify, a prompt appears that asks you if you want to reject the modify command if the original component record has been changed since the utility's most recent access to the database.

Figure 10-1 shows how you would search for a component, create a modified version of the component using HDDefine, and then replace the original component with the modified version using HDMModify.



CAUTION

Risk of database corruption

Since HDModify allows users to change the component (including the component type and state), it could potentially corrupt the database and make it useless for the Meridian Mail system. The user should be certain that the new component record obeys Meridian Mail configuration rules.

Parameters: The optional rejection of the command if the record has changed and the element number of the component array that contains the new component record.

Example (with default responses):

```
> HDModify
Should the Modify be rejected if the record has changed : No
Enter component # New component: 0
>
```

HDAdd

HDAdd adds a new component record to the hardware database that has been defined in one of the temporary component record locations. Use HDDefine to create the new component record. Read the HDDefine description to see how to use HDDefine to create a new component.

The new component record must have a unique location code or the HDAdd command will be rejected. Since HD does not check for Meridian Mail configuration rules when a component is added to the database, the user must be certain that the new record will not corrupt the database.

Figure 10-2 shows an example of HDDefine and HDAdd.

Parameters: The temporary component record number.

Example (with default responses):

```
> HDAdd
Enter component # New component: 1
>
```

HDDelete

HDDelete deletes a component from the hardware database. Before running HDDelete, use HDDefKeys and HDInitSearch to find the component record that you wish to delete.

A copy of the found component record is placed in temporary component record 0. To delete the original component record, run HDDelete and specify component number 0. The original component record is identified by its location code and deleted. The user has the option of rejecting the delete request if the record has been changed since last access.

Parameters: The temporary component record number and the option of whether to reject the request if the record has changed.

Example (with default responses):

```
> HDDelete
Enter component # New component: 0
Should the Delete be rejected if the record has changed : No
>
```

Other HD commands

HDGlobState

HDGlobState changes the state of all records that match the search key defined using HDDefKeys to the new state. After you execute this command, the system lists the components whose state was changed (this part is not shown in the example).

Parameters: The new state

Example:

```
> HDGlobState
```

Please use HDDEFKEYS to define the components you want to change.

WARNING : This procedure changes EVERY component that you define and then closes and opens the database so the change is final.

Please enter the new state : Unconfigured

HDSCSet

HDSCSet allows the user to query the database for the current silence compression option, or HDSCSet will set that option. All DSP records must have PkgID equal to Gen_32 (the International load must be specified for all DSPs) for this command to execute successfully. Otherwise, the error code HD_NotGeneral is returned and the command is aborted. Some records may already have been changed by the command before the abort occurs; the record that caused the abort will be loaded into Component[0].

During a query, the silence compression option must be the same in all DSP records. Otherwise, hd_Ambiguous is returned. If the query is successful, the return string will contain either "ON" or "OFF."

Parameters: If no parameter is supplied, the command performs a query of the current silence compression option. Query can also be invoked if the user supplies "QUERY" as the parameter. If "ON" or "OFF" is specified as the parameter, the silence compression option will be set accordingly.

Example:

```
> HDSCSet
OFF
> HDSCSet ON
```

Chapter 11: Program Resource Manager (prm_control)

This chapter describes how to start, terminate, shut down, or restart Meridian Mail programs using the Program Resource Manager (prm_control).

Loading prm_pkg

The prm_pkg is loaded by entering **load prm_pkg** from a CLI shell. The search path must contain “:BOOT100:AREA” for this command to succeed. The search path can be displayed by entering the command **search**. A message will appear when prm_pkg is loaded.

Loading prm_control

The prm_control is loaded by entering **fork prm_control** from the CLI shell. A new window in the Window Manager has been created for this program.

Commands

BlockStart

This command will block a user from executing any commands until the program that the user has requested has been loaded. The syntax for this command is identical to the Restart command.

Control

Control allows a control integer to be sent to the Control entry of the PRM. This is very dangerous, as some commands can cause the system to crash or shut down, and should not be used by maintenance personnel.

Cursor

Cursor <True | False> allows the prm_pkg to turn the cursor on or off while in full-screen mode.

ExcProg

ExcProg is used to terminate a program by making it look like the program had a runtime error. Any program displayed using the “List” command can be terminated. This is intended for development only. This command should not be used by maintenance personnel.

The command syntax is: ExcProg <index>

where: index is the index from the list command

KillProg

KillProg is used to terminate a program. Any program displayed using the “List” command can be terminated. This command is useful for terminating and restarting programs that are suffering from unrecoverable errors.

The command syntax is: Killprog <index> <method> <option>

where: index is the index from the list command

 method is either ‘Kill or Shutdown’ (Shutdown allows the program to complete.)

 ‘Restart or Unload’ will specify what you wish to happen to the program after it terminates

List

The List command is used to retrieve a “working list” of programs from the PRM. This command must precede use of the Killprog or Restart commands (each of these commands takes a “list index” from the last list command as an argument).

The command syntax is: list <progrname> <node>

where: progrname is the desired name (null = match any)

 node is the desired node (1..max processors)

The screen output contains a line for each program where:

 # is the “list index” that refers to this program

 Node is the node number of the program

 Name is the name of the program

 State is the state of the program

 Ki is the kind of program (unimportant for maintenance)

TermType is the option specified for handling upon termination

Tid is the taskid of the program

ArgString displays the program's argstring

MSPNode

MSPNode is used to choose the PRM to talk to on an SPM platform. This command applies only when the List or NodeList command follows.

MSPInfo

MSPInfo is used to display information on the current PRM. For example, the command may display that the current PRM is on MSP1.

NodeList

NodeList is used to list the status of all nodes known to the PRM. It has no arguments.

NodeReset

NodeReset is used to reset a node. This command is useful for restarting a node without rebooting the whole system (for example after maintenance).

The syntax of this command is: NodeReset <node #> <option>

where: node # is the number of the node
 option is NodeRestart (to restart all programs on the node)
 or
 NodeNoRestart (not to restart all programs)
 or
 NodeReset (to simulate powerdown and powerup of the node)

Nuke

Nuke is used to kill the PRM. This should cause the OSP to restart the PRM, and effectively reboot the system. If possible, this command should not be used. If it is necessary to restart the system, power the prime node down and then up.

PrmCheckStart

This command is used to get the PRM to check the STARTLIST while the system is in operation, and make changes to the system based on changes that have been made to the STARTLIST. If there is an error, the PRM will revert the system to its original state.

The syntax of this command is: PrmCheckStart <node #> Shutdown | Kill

where: **node #** is the node number for which PRM is to check
STARTLIST (-1 for all nodes)

Shutdown | Kill is used to tell if the programs are to be
brought down gracefully (Shutdown) or killed immediately
(Kill)

PrmDebug

This command sets a debugging flag in the PRM. This command was intended for development only. If, for any reason, debugging gets turned on, use this command to turn it off.

PrmInfo

PrmInfo is used to display the type of hardware that exists on each node in the system.

PrmMenu

PrmMenu puts the prm in a full-screen mode. A hierarchy of commands that can be accessed by typing a single letter will appear. This command is useful for creating a continuous list of the status of programs on a node.

PrmOSLoaded

PrmOSLoaded is used to determine when all nodes that are being booted have been booted successfully. Note that this command will not return (that is, it is blocked) until all nodes have been booted. This command should not be used by maintenance personnel. This command has no argument and no output or display.

PrmProgInfo

PrmProgInfo is used to retrieve the current number of programs the PRM is running, and the maximum that can be run by the PRM.

PrmRestart

PrmRestart is used to reset the whole system. This command is included for completeness only, and should *never* be used. If it is ever necessary to restart the system, power the prime node down and then up.

QueryNode

QueryNode <virtnode> allows a user to query the state of a given node. Returned states include Loading, Shutting Down, and Running.

Restart

Restart is used to restart a program that is not presently running. This command is useful for restarting programs that have died and not restarted for any reason.

The command syntax is: Restart <index> <tid>

where: index is the index from the list command
 tid asks whether you want to send the last known taskid or not
 (NO is a sufficient response)

RunProg

This command is used to start a program not specified in the STARTLIST. This program will not be restarted when the system is rebooted.

The command syntax is: RunProg <name> <node#> <argString>

where: <name> is the name of the program
 <node#> is the node that the program is to run on
 <argString> is the argument string given to the program
 when it starts

TaskStatus

TaskStatus <Tid | Monid> <index> allows a user to query the status of either the monitor or program task of a program that has previously been listed using the List command.

Note: Hitting the <Esc> key while the screen is redrawing in full-screen mode can cause the cursor to remain in off position.

11-6 Program Resource Manager (prm_control)

Chapter 12: VS/MI Server Tool (vsmup)

Volume Server — MI Utility Package (vsmup)

The Volume Server—MI Utility Program (vsmup) is a utility program consisting of two packages: one for low-level Mass-storage Interface (MI) operations and one for Volume Server operations.

MI operations include creating, deleting, copying, and listing disk volumes as well as other administrative and diagnostic functions.

VS operations include formatting volumes, displaying VS operational measurements, starting audits, volume compression, volume expansion, and invoking VS control functions. Open File Server (OFS) programs can also be controlled.

Program startup

Log on to the ETAS-level utilities menu and select vsmup. This will start up vsmup in another virtual window. To access this window, type <Ctrl><w> and select vsmup from the window by using the cursor keys, then press Enter.

Commands

Help

Once the vsmup package is running, the help command can be used to get more information on the available commands. Type **help** to get a list of all the commands. Type **help vs** for one-line descriptions of all VS level commands. Type **help mup** for MI level commands. For some commands you can type **<command> ??** to get more detailed information on the particular command. For example, **adjustspace ??** gives you information on the adjustspace command.

Volume Server—MI Utility Package (vsmup) commands

The commands in vsmup require parameters. If these parameters are not entered with the command, the user is prompted for them. When the prompts appear, if there is a default value for the field, it appears next to the parameter. If no default value is given, a value must be specified. If a default value is given, this field can be line-edited.

Adjust

This command is used to change the internal configuration parameters. Type **adjust ??** for a list of the parameters that can be changed as follows:

- MaxOFR Maximum number of physical open files.
- MaxBR Maximum number of blocks associated with open files.
- MaxCR Maximum number of RC clients.
- MaxSR Maximum number of users Space Record.
- MaxqRW Maximum number of files allowed in quick RW mode.
- qRWTimeOut Maximum time a client can hold a file open qRW(ms).
- NBuffers Number of IPC buffers.
- SweepRate Rate at which dead files are closed (files/hr).
- Ni Maximum number of incoming blocks lost in a crash.
- No Maximum number of outgoing blocks lost in a crash.
- AuditDelay Number of 30 minute delays of the audit to accommodate a running online backup.
- AuditHour Hour of audit.
- AuditMin Minute of audit.
- BackupDelay Recommended number of days between backups (ignored).
- MaxUserBRs Maximum number of Block Records associated with 1 file.

The command prompts you for the volume ID of the volume server, and since this operation must be performed offline, it prompts to see if it should shut down the volume server. The default is “No,” and if this is chosen, the Adjust command terminates. Otherwise, it prompts for the MI Name. It then prompts to see if the default configuration parameters are desired. If **No** is entered, the user is given a series of prompts containing each of the configuration parameters accompanied with their default value. These values can be line-edited, or their default values can be chosen by entering <CR>.

Adjustspace

This command is used to adjust the physical space of a volume. Currently the space allocation can only be increased. The size of the new space allocation can only be as large as the amount of available contiguous space on the disk. Note that this space does not need to follow the volume immediately. This command adjusts the volume space by making a duplicate copy of this volume at the new location with the available contiguous space. For example, if the volume is currently 1000, and the contiguous free space is 1500, the volume can only be increased in size by 500 to 1500.

The first prompt is for the volume ID of the volume server. Since this operation must be performed offline, the user is prompted to see if the volume server should be shut down. The default is “No,” and if this is chosen, the Adjustspace command terminates. Otherwise, it prompts for the MI Name, the volume type (Text or Voice), and the desired volume size for the volume server.

AdjustUsers

This command is used to alter the maximum number of registered users that can be listed on the volume. The first prompt is for the volume ID of the volume server. Since this operation must be performed offline, the user is prompted to see if the volume server should be shut down. The default is “No,” and if this is chosen, the AdjustUsers command terminates. Otherwise, it prompts for the MI Name. It then prompts for the new maximum number of registered users. Once the change has been made, the message “Writing System blocks to disk” appears.

AdjustVirtual

This command is used to adjust the virtual space of a volume. The virtual space includes all linked files in its calculation of space utilization. The first prompt is for the volume ID of the volume server. The next prompt is for the desired amount of Virtual Text space, and the last prompt is for the desired amount of Virtual Voice space.

Audit

This command is used to start an audit on a volume. The audit reclaims any lost blocks. If the “+D” option is used, additional integrity checks are done. This command prompts for the Volume ID of the volume on which to perform the audit. To start a shadow disk audit, use the Control command.

Bill

This command changes (adds or subtracts) the space usage for a user on a volume. It prompts for the volume ID and user’s client ID.

Compress

This command is used to compress a voice volume. It prompts for the volume ID and the new volume size in blocks. If the size is negative, the text volume is compressed; otherwise the voice volume is compressed. The compression operation is started and is done in the background. The MI level size of the volume is not changed by this command.

Control

This command is used to perform a variety of control functions. It accepts two parameters as input. The first is the volume on which to perform the function. The second is a control code that corresponds to the particular control function to be performed. Enter **control ??** to get a list of the control functions that can be performed, and their corresponding codes.

For example, to start a shadow disk audit, use control codes 23 to 27. Note that the node where the audit is going to run must have shadow disk installed and enabled.

Demon

This command is used to start the Garbage Demon on a particular volume. The Garbage Demon deletes all files whose expiry date has been reached. The expiry date is set in the user’s personal profile in the filekeeptime field. This command prompts for the Volume ID of the volume on which to start the Garbage Demon.

ExpandInPlace

This command is used to expand a volume into the space after it. For example, if the volume is currently 1000, and the free space following this volume is 1500, then the volume can be increased in size by 1500 to 2500.

The first prompt is for the volume ID of the volume server, and then since this operation must be performed offline, it prompts to see if it should shut down the volume server. The default is “No,” and if this is chosen, the ExpandInPlace command terminates. Otherwise, it prompts for the MI Name. It then prompts for the volume type (Text or Voice), and the desired volume size.

Format

This command is used to initialize the volume. The user is first prompted for the volume ID of the volume server. Since the formatting operation must be performed offline, the next prompt is to see if it should shut down the volume server. The default is “No,” and if this is chosen, the Format command terminates. Otherwise, it prompts for the MI Name of the text volume. It then prompts to see if the default configuration parameters are desired. If **No** is entered, the user is given a series of prompts containing each of the configuration parameters accompanied by their default value. These values can be line-edited, or their default values chosen by entering <Return>. Lastly, it prompts for the MI Name of the voice volume. Once the operation has completed successfully, the message “Volume formatted successfully” appears.

Getstate

This command prompts for the volume ID and returns the current state of the specified volume server. Possible states are Normal, Auditing, Backup, Locked, Garbage Demon, Compressing, and ShadowDisk.

Inquire

This command is used to list the user space of a particular user on the volume. It prompts for the Volume ID and the client ID.

Kill

This command is used to shut down the volume server immediately without saving any of its control structures. This forces a recovery the next time the volume server is started. This should only be done if the Shutdown command does not work. Using this command, you can lose up to $N_i + N_o$ blocks (the number of blocks in and out since the last write). This command requires the Volume ID as a parameter.

MakeVSVol

This command is used to create and format a new VS volume. It creates both a text and voice volume. It prompts the user for the volume number of the VS volume to create, followed by the number of text and voice blocks desired. The new VS volume is then created, provided there is sufficient space on the MI. Once the volume is formatted, you can start the volume server in order to access the volume.

OFSControl

This command prompts for the virtual node number and the integer control code. Valid OFS control codes are

- 3 to restart an OFS
- 11 to clear its cache

OFSOMDisplay

This command prompts for the virtual node number of the OFS, then displays certain operational measurements. The “+R” option will reset counters to zero. The operational measurements include cache sizes, cache accesses, hit rates, amount of cache in use, number of block purges, and the number of cache clears.

OMDisplay

This command is used to display operation measurements for a particular volume server. This command requires the Volume ID of the desired volume for which to print these statistics.

Two options can be used with this command:

- Entering **OMDisplay <vol ID> +r** resets all measurements that are calculated in relation to a certain point in time (such as the number of Creates done).
- Entering **OMDisplay <vol ID> +i** gives internal operation measurements for the VS volume.

Sharedseg

This command displays the volume server table for this node.

Showparms

This command is used to display the internal configuration parameters for the specific VS volume, for example, MAXOFR, MAXBR, and MAXCR and so on. The volume ID and the server name are the required input.

For the meanings of the symbols that are shown in Showparms command, type **showparms ??**.

Showvolused

This command is used to display the percentage used up in the text and voice volumes. Volume ID of the volume is required and the volume server for this volume needs to be running for this command to work.

Shutdown

This command is used to shut down the VS volume. It writes out the internal control structure, and there is no need for a recovery when the volume server is restarted. It requires the Volume ID as a parameter.

Tapadjust

This command is used to adjust the size of a MISA volume upward to fill the size of the MI volume to which it has been copied.

You are first prompted for the volume ID of the volume server. Since this operation must be performed offline, you are then asked if the volume server should be shut down. The default is No and if chosen, the command terminates. Otherwise, it prompts for the MI Name and continues.

Vserror

This command is used to translate the VS return code into English. It prompts for the return code number.

VSOFR

This command is used to display the specified OFRTable entry on the specified volume. It requires the VS Volume ID, and the OFR number as input parameters. If **+C** is added, the CRTTable entries for that OFR will be shown. If **+B** is added the BRTTable entries for that OFR will be shown. If **+A** is added, both CRTTable and BRTTable entries for that OFR will be shown. If **+S** is specified, the volume system blocks are displayed. If **+O** is specified, the array of known OFSs is displayed. This command locks the VS Volume while the command is in execution.



CAUTION

Risk of improper file operations

If you use the VSOFR command while Meridian Mail is answering calls, file operations may not work properly.

MI Utility Package (MUP) commands

MUP maintains a current working environment which provides common information required by several commands. The environment must be set before most other commands will work. The only environment information required is the MI Name (MNSET). The MI is upper/lower case sensitive to all string Names.

changename

Change the name of the mi server saved on disk. The mi server name can be up to 8 characters. The mi server name must be "FAST" or "1" for the MSP, and "FASTn" or "n" for all other nodes, where n is the node number. This command should not be used unless the mi server name on disk for the specific node is incorrect. For example, if the mi server name must be changed from "FAST" to "FAST2," enter:

```
>changename
enter new server NAME (max 8 chars): FAST2
```

configsize

Displays the configured size of the disk in Kbytes; in this way smaller disk sizes can be created from a larger disks. The configured size below shows a disk configured as 150 Mbytes, even although the actual size of the disk (physical size) is larger:

```
>configsize
150500
```

configure

Changes the configured size of the disk; in this way smaller disk sizes can be created from larger disks. A password is required to change this value. For the changes to take effect you must answer **yes** to the prompt, "Do you want to save the changed control block?"

```
>configure
Password $$$$$$$$$$
Size 150500
Do you want to save the changed control block? yes
```

controlb

Displays the mi server disk control block information. Under normal circumstances the "list" and "stats" commands are more useful. The "BlkSize" is given in bytes. The beginning of and end of each volume are

12-10 VS/MI Server Tool (vsmup)

specified by “Start” and “Finish,” and are the Kbyte offset from the beginning of the File Region; the File Region starts at 700 Kbyte offset from the start of the disk on Option 11 Systems, and at 1016 Kbyte offset from the start of the disk for all other systems. An example of the command is shown below:

```
>controlb
Name
Version
Size
Number of vols
Freeheaders
Busyheaders
Dump BUSY, FREE, ALL or SPECIFIC volumes? Busy
VolHeader 1
Name      VS1V
BlksRead  0
BlksChanged 0
BlkSize   8192
Start     10
Finish    17009
Next      2
Prev      -1
VolHeader 2
Name      VS1T
BlksRead  0
BlksChanged 0
BlkSize   1024
Start     17010
Finish    37369
Next      3
Prev      1
...
>
```

diskinit

Initializes the disk control block; this writes the default configuration information to the disk. A password is required for the disk to be initialized.

**CAUTION****Risk of data loss**

This operation will destroy all information on the disk.

The mi server cannot access a disk that has not been initialized, however, this is performed automatically during the installation and restoration of a system.

>diskinit

Password \$\$\$\$\$\$\$\$

Do you want to initialize the disk? **yes**

disksize

Displays the configured and physical size of the disk in Kbytes. The configured size of a disk allows standard disk sizes to be created from larger disks. The physical size of the disk is the actual size of the disk after the format, which depends on the disk manufacturer and how the disk was formatted. The configured size is always smaller than or equal to the physical size. An example is shown below:

>disksize

Meridian Mail Disk Configuration Info

The Physical size is 451481

The Configured size is 140500

dumpvolume

Display specified blocks of a volume in hexadecimal and ASCII, for example:

>dumpvolume

Enter volume name: VS1T

enter volume block address (-1 to exit): 0

enter number of bytes to read: 64

```
00003438 3FF90000 00060000 48800000 48C00000 4F800400 ..48?.....H...H...O...
56533154 20202020 00004880 000048C0 00000000 08003FFA VS1T  ..H...H.....?.
00000005 00000140 00000180 00000840          .....@.....@
```

enter volume block address (-1 to exit): -1

envdisplay

Displays the current MUP working environment. An example of the output is shown below for the MSP (Node 1) and the environment volume name of VS1T.

>envdisplay

MI_Server name: FAST

Volume name: VS1T

getvstats

Return the volume size or the block size of a specified volume. This command is provided for use in CLI execs. The possible fields are

Size: The size of the volume in blocks.

BSize: The size of the blocks for the volume in bytes. This can only be 1096 or 8192.

For example, to obtain the size of VS1T:

>getvstats

Enter volume name: VS1T

What field: **Size**

20360

list

Display all volume information for the current `mi_server`. The default display lists the volumes sorted sequence; the sorting can be switched off by using the `'-s'` flag. The typical output is shown below:

```
> list
```

volume name	time created	block size	volume size	start track	end track
VS1T	70 01 01 00:05	1024	20360	17010	37369
VS1V	70 01 01 00:05	8192	2125	10	17009
VS2T	70 01 01 00:05	1024	7000	37370	44369
VS2V	70 01 01 00:05	8500	44370	44370	112369

bytes	blocks	Kbytes	Kbytes
-------	--------	--------	--------

The 'track' refers to the kilobyte offset from the start of the disk space above the boot area.

micontrol

Control specific operations in the `mi_server`. This interface is primarily provided for testing the `mi_server` and should be used with caution, as certain commands can cause the system to reboot. The commands and their operation are:

ready: Verify that the current node can communicate with the mi server.

sanity: Simple sanity checks on the internal tables of the mi server.

update: Update the mi server internal tables from disk.

lock: Block all accesses to the mi server.

unlock: Reenable access to the mi server.

For example, verify that the current mi server is sane:

```
>micontrol
Control Function: sanity
```

miinfo

Display internal information of the mi server. This command is especially useful in CO systems to verify which SCSI buses and which volumes are directly accessible from a node. There are two different options: volTable and miTable.

volTable: Displays the internal volume tables for the current node, and the alternate node of a CO system. A sample of the output and a description of each column is shown below:

```
>micontrol
Control Function: volTable
BOOTVOL    0      0      999      1
VS1V       3      10     17009     2
VS1T       0     17010     37369     2
VS2T       0     37370     44369     2
VS2V       3     44370     112369     2
0          0      0      0
0          0      0      0
0          0      0      0
0          0      0      0
0          0      0      0
0          0      0      0
0          0      0      0
0          0      0      0
```

Volume Name	Block Size (0=1K, 3=8K)	Start	Finish	Disk Region
----------------	----------------------------	-------	--------	----------------

Systems that have a single SCSI bus use entire table for volumes from the disk on that bus. Systems that have cross connected SCSI buses (CO Systems) have the table is split in half, with the upper half containing the volumes from the odd node's disk and the lower half containing the volumes from the even node's disk.

miTable: Display the disk access information for all the SCSI busses. A sample of the output and a description of each column is shown below; a value of -1 means that the item is not defined. An example of the output is shown below with a description for each column:

>**micontrol**

Control Function: **miTable**

-1 1 3 150500 451481 0 1 2 0 19 4

-1 -1 -1 -1 -1 -1 -1 -1 -1 -1

Node Number	Disk Number	MI Name	Configured Size	Disk Size	SCSI Port	IPL ID	Swapper ID	Start Index	Finish Index	Defined Volumes
----------------	----------------	------------	--------------------	--------------	--------------	-----------	---------------	----------------	-----------------	--------------------

mispace

Displays the free space in kilobytes on the disk, within the configured size of the disk (see **disksize** command). Note that the disk requires a certain amount of free space for specific tasks, for example during on-line backups a temporary backup volume is created on the disk. In this example, the free space on the current server is listed.

>**mispace**

38131

mnset

This command allows you to select a mi server for future MUP operations. The default is 'FAST' which is the mi server for the MSP (Node 1). To select the mi server on another node append the node number; for example to select the mi server on node 3 type in **FAST3**, or just the node number **3**. After the mi server has been selected with the **mnset** command, all other mi commands operate for that mi server. In this example, select the mi server on node 3 is selected:

>**mnset**

enter server name: **FAST3**

renamevol

Changes the name of a volume. The new volume name can be up to 8 characters. MUP fills the remaining characters with blanks. This command should not be used, and is only provided for testing purposes; the volume name defined by the mi server does not change the internal names defined by the VS. Here is an example that changes the volume with the name VS88J to a name VS99X:

>**renamevol**

Enter volume name: **VS88J**

enter new volume name: **VS99X**

stats

Displays status information of the mi server. An example of the output is shown below:

```
>stats
NAME:          |FAST | HEX:          |4641535420202020|
Configured size (Kbytes):      150500
KBytes used:                   112360
Number of volumes:              4
Largest free (Kbytes):         38131
Port 0 status                  Prim and Sec OK
Port 1 status                  No status
Server locked:                 NO
Swapper size (Kbytes):         451481
Defer queues used:             0
Task Buffer Retries            0
Disk Queue retries            0
```

storeloadvol

This command allows you to copy the content of a MI volume to a helix file, and vice versa. Absolute or relative pathnames can be used for the helix file.

**CAUTION****Risk of data loss**

Loading a volume to a working system could destroy the system.

The two options are:

load: Restores a mi volume from a helix file. An example is shown below where the backup volume is restored from file :RW100:BACKUP to VS901T.

```
>storeloadvol
Do you want to LOAD or STORE the volume? load
Enter volume name: VS901T
HELIX file to load?:RW100:BKUPVOL
```

```
.....
.....
.....
```

store: Copy an entire mi volume to a helix file. An example is shown below where the entire backup volume VS901T is stored to the helix file :RW100:BKUPVOL.

>**storeloadvol**

Do you want to LOAD or STORE the volume? **store**

Enter volume name: **VS901T**

HELIX file to save volume as? **:RW100:BKUPVOL**

.....
.....
.....
>

Note: There must be sufficient free space on the destination volume to hold the helix file, which will be the same size as the entire source volume.

testvolume

Test the mi software, SCSI software and the disk drive. Data is written to the specified volume, and then read back for comparison.



CAUTION

Risk of volume corruption

This test is destructive and will corrupt the specified volume. Do not run this command on a working system.

An example of testing a disk with a specially created test volume VS99V is shown below:

```
>testvolume
Enter volume name: VS99V
CAUTION: data on volume will be corrupted by test.
Sequential, Scattered, Random testing? Sequential
Enter starting address: 0
Chunk size: 8192
How many chunks per test (0 for complete volume): 80
Enter number of writes: 1
Enter number of reads: 1
What kind of data? Variable
write 1
.....
read 1
.....
TEST VOLUME complete; There were 0 errors.
```

timevolume

Measures the speed of the disk subsystem. This is also useful for testing the disk and SCSI hardware.



CAUTION

Risk of system corruption

If the time writing test is selected then the specified volume will be corrupted. Do not run a write timing test on a working system.

An example of a read timing test on volume VS2T is shown below:

```
>timevolume
Enter volume name: VS2T
Sequential or Random timing? Random
enter length of test record in blocks: 1
enter number of times to time operation: 1000
```

CAUTION: data on volume VS2T will be corrupted by write timing test.
Read or Write timing? Read

```
time for 1000 i/o's of 1024 bytes = 27540 ms.
time for 1 i/o of 1024 bytes = 27 ms.
>
```

Sequential timing will advance the head sequentially from the beginning to the end of the volume; random timing will select blocks randomly from the volume. The length of the test record can be a maximum of 8 Kbytes; hence, for text volumes this can be up to 8, and for voice volumes this can only be 1. The maximum number of times to time the operation is 32767.

vdelete

Deletes a volume from the disk. It prompts you for the name of the volume to be deleted, and then asks for confirmation. An example deleting volume VS3T is shown below:

```
>vdelete
Enter volume name: VS3T
deleting volume VS3T
DO YOU REALLY WANT TO DELETE THIS VOLUME?: yes
```

vmake

Creates a new volume on the disk. There must be sufficient free space on the disk before the volume will be created.

```
>vmake
Enter volume name: VS3T
making volume : VS3T
volume block size in bytes : 1024
enter number of blocks for volume: 100
```

volnameset

Sets the environment volume name; future operations will have this default volume name. The environment volume name is also changed when running any MUP command that prompts for a volume name, hence this command is not very useful. An example is shown below:

```
>volnameset
Enter volume name: VS3T
```

vsizchange

Changes the size of a volume. The new size may not overlap any other volume, or go beyond the configured size of the disk.

An example is shown below:

```
>vsizchange
Enter volume name: VS3T
Changing size of volume: VS3T
new number of blocks for volume: 200
```

vstats

Displays statistics for a specific volume. An example of the output is shown below:

```
>vstats
Enter volume name: VS2T
volume name:                VS2T
block size(bytes):          1024
volume size (blocks):       21385
blocks read:                 158
blocks written:              45
```

The blocks read and blocks written are reset to zero every time the vstats command is executed.

vtovcopy

Makes a copy of an mi volume. The destination and source volumes do not have to be on the same node. The example below copies the volume VS3T on node 1 to a volume VS302T on node 2.

>vtovcopy

Enter existing volume name **VS3T**

Enter server name of existing volume: **FAST**

Enter new volume name **VS302T**

Enter server name of new volume: **FAST2**

Note: A volume server should not be running on the source volume or else the copy of the volume may be inconsistent.

Chapter 13: Call Progress Tone Detection (cptd_util)

This utility allows you to configure the Call Progress Tone Detector (CPTD) which is used when outcalling services are needed on Meridian Mail. CPTD capabilities can be configured to recognize the call progress tones (dial tone, ringback, line busy, etc.) implemented in the country or location in which Meridian Mail is installed. This utility can also be used to view the CPTD parameters currently configured.

**CAUTION****Risk of data loss**

Parameter changes can drastically change the behavior of the CPTD module. This utility should only be used by trained installation technicians or under the guidance of Product Support.

The CPTD Administration menu

When you select the `cptd_util` from the ETAS main menu, the CPTD Administration menu shown in Figure 13-1 is displayed.

Note: Changes made to CPTD configuration will not take effect until after you exit from `cptd_util` and reboot the system.

Figure 13-1
The CPTD Administration menu

CPTD Administration

General Information:

All times are presented and entered as thousands of a second.
Internally times are stored in 16 millisecond units.

Instructions will be provided on the use of each screen prior to its presentation if HELP has been turned on.

Country: Your_Country

1	Cadence Parameters	2	DFT Band Numbers
3	Filters for DFT Band Numbers	4	Frequency Band Threshold Table
5	Other Timeout Values	6	SIT Data
7	Filter Coefficients	8	Reserved Parameters
9	Non Repeating Tones	10	Country Name
11	Restore Complete CPTD File	12	Turn On/Off HELP
13	Exit	14	Pager Detection Bands

Select one of the above:

Entering data

In most cases, when you select an option from this menu, you will be presented with modifiable fields or fields for data entry. They will be presented one line at a time. When entering data, keep the following guidelines in mind:

- If the help mode is turned on, you will see help text before being given access to the fields. The text briefly describes the set of fields that you will be viewing and/or changing. If the help mode is off, you will have access to the fields as soon as you choose the option from the CPTD Administration menu.

- There are either numerical or textual restrictions on the range of values that may be entered for most data entry fields (except for the Country Name). You may use the cursor up and cursor down keys to view the range of acceptable values or enter the value yourself (as long as it is within the range of acceptable values). When entering a number value, you may prefer to type the desired value yourself.
- For entries involving units of time, your entry will either be rounded up or down to the nearest multiple of 16 ms. Therefore when reviewing data, you will probably notice that the values you have entered have changed somewhat.
- If you mistakenly entered incorrect values, you may restore the default values by exercising the Restore Default Values option that usually appears as you move to the menu option.

The following sections describe the items that can be selected from the CPTD Administration menu. Since each installation may have different needs for this utility, depending on which parameters must be changed, there is no single method for proceeding through this utility. However, Options 1 (Cadence Parameters) and 9 (Non-Repeating Tones) will likely be the only parameters requiring modification for most sites.

1 — Cadence Parameters

A cadence is a sequence of on-off patterns with specific timings which repeat continuously. Typical examples are the ringback and linebusy tones. There are up to 36 cadences to choose from.

Some of the cadences are already defined whereas others are unconfigured. See Figure 13-2. To change a current definition, pick a cadence that is already defined. To create a new cadence, enter the number corresponding to an unassigned cadence.

Figure 13-2
The Cadence Parameter screen

Cadence Parameter Screen

Cadence Parameters

1	Ringback	2	Ringback
3	Ringback	4	Linebusy
5	Reorder	6	Unassigned
7	Unassigned	8	Unassigned
9	Unassigned	10	Unassigned
11	Unassigned	12	Unassigned
13	Unassigned	14	Unassigned
15	Unassigned	16	Unassigned
17	Unassigned	18	Unassigned
19	Unassigned	20	Unassigned
21	Unassigned	22	Unassigned
23	Unassigned	24	Unassigned
25	Unassigned	26	Unassigned
27	Unassigned	28	Unassigned
29	Unassigned	30	Unassigned
31	Unassigned	32	Unassigned
33	Unassigned	34	Unassigned
35	Unassigned	36	Unassigned
37	View Cadence Parameters	38	Restore all Cadence Data
39	Cancel	40	Exit

Select one of the above:

Note: The values for these cadences should be obtained through product/support.

To simply view the parameters of all cadences at a glance, enter option 37. A summary screen is displayed as shown in Figure 13-3. To obtain a hard copy, perform a print screen.

At least one ringback and one linebusy cadence must be defined. If they are not, you will not be allowed to exit the menu.

Figure 13-3
The View Cadence Parameters screen

View Cadence Parameters														
Report	Code	Repeat	on 1		off 1		on 2		off 2		on 3		off 3	
		Count	min	max	min	max	min	max	min	max	min	max	min	max
Ringback		896	1504		3536	4448								
Ringback		1728	2256		3536	4448								
Ringback		736	1248		2624	3360								
Linebusy		384	608		384	608	160	336	160	336	160	336	160	336
Reorder		160	336		160	336								
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
Unassigned														
*** Press carriage return to continue ***														

When you select one of the cadences displayed on the Cadence Parameter screen, the fields shown in Figure 13-4 will be presented one at a time. As you enter a value for a field and press <Return> (or accept the current value by pressing <Return>), the next field is displayed. For example, if you were to select item 5, the reorder cadence, you would see the following fields:

Figure 13-4
Cadence Parameters

Cadence Menu Item 5

Report Code

: Reorder

* Repeat Count

: 0

Number of Timing Patterns

: 3

On min time 1

: 160

On max time 1

: 336

Off min time 1

: 160

Off max time 1

: 336

On min time 2

: 160

On max time 2

: 336

Off min time 2

: 160

Off max time 2

: 336

On min time 3

: 160

On max time 3

: 336

Off min time 3

: 160

Off max time 3

: 336

Are these values correct?

:

* Do not change this field. It is not implemented in this release.

The following fields define each cadence:

- **Report Code** The name associated with the cadence definition, such as ringback and linebusy. Duplication of cadence names is possible for different patterns (to allow for the multiple tones that some countries use for conditions such as ringback). To view all possible report codes, use the up or down cursor while in this field.
- **Repeat Count** This field is reserved for future use and is non-functional in the current software release.
- **Number of Timing Patterns** This field indicates the number of on-off patterns in the sequence. A cadence may be composed of a minimum of 1 and a maximum of 3 on-off sections which repeat themselves.
- **On min time/On max time** This field indicates the duration of each on-time in the cadence pattern. The on-time must be specified as a range, as defined by a minimum and maximum value.
- **Off min time/Off max time** This field indicates the duration of each off-time in the cadence pattern. The off-time must be specified as a range, as defined by a minimum and maximum value.

Note: We suggest that your range cover at least a 15 per cent deviation from the mean value (unless you have tone specifications that indicate otherwise), as tolerances can be quite wide for call progress tones.

The same timing pattern cannot be used for two or more different cadence report codes. If such a conflict exists, you will not be allowed to exit the cadence menu until each timing pattern is configured as distinctly unique from all others that have different report codes.

2 — DTF Band Numbers

This field is reserved for future use.

3 — Filters for DTF Band Numbers

This field is reserved for future use.

4 — Frequency Band Threshold Table

This option is used to change the sensitivity of CPTD to inband signals, SIT tone frequencies and voice. This should only be done in the case of unusually bad signal-to-noise ratios. Contact your Product Support representative before changing these values.

5 — Other Timeout Values

These timeout values may be useful for fine tuning the action of CPTD in its recognition of a continuous tone (like a dial tone), voice, pager tone, ringback stopped and silence. Consult Product Support before making any changes.

Ringback Stopped Time

This value specifies the duration of silence that must be encountered before CPTD will report a break in the ringback cycle (indicating that a call has been answered) once CPTD has already reported ringback. This time must be greater than two times the maximum silent period in the ringback cadence.

Dialtone Detection Time

This value denotes the duration of a continuous inband tone that must be encountered before CPTD reports a continuous tone. This time must be more than twice the maximum on-time of any ringback cadence, and greater than the maximum on-time of any of the remaining cadences.

Report Code

Typically the continuous tone report code is “Dialtone,” however, in some cases, such as in the U.K., its significance is “Number Unobtainable.” Changing this field allows the continuous tone to be reported as such.

Fast Dialtone Detect Time

This is applicable to the Meridian Mail Modular Option GP platform only. It denotes the duration of a continuous tone that must be encountered upon initiation of an outcall. After this minimum time has passed, the system can begin sending the DTMF tones that place the call. At call initiation, the presence of a short duration of continuous tone is all that is required to determine the presence of dialtone, since no other call progress tones can be presented prior to the dialtone.

Minimum Long Silence Time

This value represents the minimum duration of silence necessary for CPTD to report that a call has been answered by silence. This time must be longer than the Ringback Stopped Time.

Long Silence Range

On AML/CSL systems only, this is the duration of silence required before a report is generated. This silence duration may have a value between

Minimum Long Silence Time and (Minimum Long Silence Time + Long Silence Range). This value, if incorrectly configured, is particularly dangerous. Be absolutely certain of the value you want to enter.

Unrecognized Signal Timeout

This is the time that CPTD will continue to look for a valid signal starting from the time the call was initiated. If this time expires, then CPTD will send an “Unrecognized Signal” message; the subsequent result is usually that the application performs a call disconnect. This time should not be set too low, and cannot be set to less than 30 seconds. You need to provide enough time for complete signals to present themselves.

Paging Tone Duration

This is the time that must pass after the initial detection of a pager tone frequency, during which no extraneous signal must be encountered. This time must pass with no incident for CPTD to report call answered by a pager. By default, CPTD will detect a pager tone frequency of either 1000Hz, 1400Hz, or 1800Hz.

The four remaining parameters are Ascending Envelope Frame Count, Descending Envelope Frame Count, Wideband Energy Frame Count, and Noise Energy Frame Count are used in combination to modify CPTD’s sensitivity to a call answered by voice. In general, increasing any of these values will make CPTD less sensitive to voice artifacts. These should never be decreased from their original values, only increased.

6 — SIT Data

This option is used to configure recognition of the Special Information Tone (SIT). This tone is a rising sequence of three tones usually signifying that a bad number has been called. You may change the minimum on/off times for each of the three tones as well as the code used to report it.

7 — Filter Coefficients

These values should only be changed on the advice of Product Support and as a last resort when all other attempts to get CPTD to recognize tones fails. These values drastically affect the way that CPTD filters and hence analyzes the incoming signal.

8 — Reserved Parameters

Reserved for future use.

9 — Non-Repeating Tones

This class of tones is very similar to cadences, and are used in conjunction with cadences. However, instead of repeating themselves continuously as cadences do, they are presented one time only and are preceded and followed by silence. The following fields are presented:

- **Report Code** This field is an identifier for the non-repeating tone. Examples are ringback and confirmation tone. To view all possible report codes, use the up or down cursor while in this field.
- **Minimum Leading Silence Time** The length of the silence that precedes the tone.
- **On-Off-On Times (or On-Off-On-Off Times)** This field defines the pattern of the non-repeating tone. To specify an on-off-on pattern define ontime 1, offtime 1 and ontime 2. Enter zeros for offtime 2 and ontime 3. To specify an on-off-on-off pattern, enter non-zero values for all fields.
- **Minimum Trailing Silence Time** The length of the silence that follows the tone.

10 — Country Name

The name of the country in which the Meridian Mail system is installed. This field holds up to 20 characters.

11 — Restore Complete CPTD File

When selected, this option causes the current configuration file to be replaced by a set of backup default parameters. This is intended as a safety mechanism in the event that parameters are altered to the extent that CPTD no longer functions. The backup that is restored is based on the configuration file that was present at installation. Therefore, any changes made since installation are lost. If this procedure does not work, contact your Product Support representative.

12 — Turn On/Off HELP

Selecting this option toggles Help on or off. When help is on, help text is provided with each menu selection.

13 — Exit

Selecting this option ends the program, with any parameter changes that you made being saved. These changes will not be activated until you reboot the system.

14 — Pager Detection Bands

Selecting this option allows you to enable/disable usage of individual SIT filter bands for detecting pager tones. The precise definition of each band is dependent on the coefficients used (see menu option 7), but if the default coefficients are used, then enabling SIT band 1 allows detection of a 1000 Hz pager tone; enabling SIT band 2 allows detection of a 1400 Hz pager tone, and enabling SIT band 3 allows detection of an 1800 Hz pager tone.

Chapter 14: Voice Prompt Information (vx_pkg)

This utility is used to determine which languages are stored under the language cabinets as well as which prompt file was copied from the tape. The utility is also used to determine the version of the prompt files.

Loading command

To load the package, issue the following command:

load vx_pkg

Only one command is available in this utility. This command displays information about the language and the prompt files stored in the cabinet.

Command format

The format of this command is

VXINFO <volume number> <cabinet name>

where <volume number> is the parameter for the volume on which the language exists, and <cabinet name> is the parameter for the language cabinet name.

If you do not enter the specified parameters, Meridian Mail prompts you for the volume number and the cabinet name as in the following example message.

Enter VolID where the prompt files are located: 2

Enter the Language Name of the prompt files: lang1

Note 1: The default is “lang1”. Use the up and down arrow keys to select more languages.

Note 2: The system offers you a list of valid cabinet names that you can choose from.

Volume numbers and language locations

The following is a list of systems with information on volumes where languages are located.

- On Card Option systems, all languages are on volume 1
- On all other systems, languages 1 and 2 are on volume 2
- On 1and 2-node systems, languages 3 and 4 are on volume 2
- On systems with three or more nodes, languages 3 and 4 are on volume 1

Chapter 15: Diagnostics Utility (diag_util)

The Diagnostics Utility (diag_util) provides a menu which lists the diagnostic utilities which can be run to troubleshoot hardware problems which are intermittent, load related, cabling related, or caused by interaction between hardware components. This menu is called “Diagnostic Utility Main Menu” and appears when you start up diag_util from the ETAS level menu (see Procedure 15-1).

Note: ETAS personnel will only be able to use this utility in its menu-format.



CAUTION
Risk of data loss

Before you test your hardware, you must first put it out of service.

Procedure 15-1
Starting up diag_util

- 1 Select the Perform Hardware Diagnostics from the ETAS level menu.
- 2 Press <Ctrl>-<W> to activate the Cobra control window.
- 3 Position the cursor beside the diag_util item and press <Return>.

The Diagnostic Utility Main Menu appears.

Procedure 15-2
Removing the diag_util

- 1 Select Exit from the Diagnostic Utility Main Menu.
- 2 Press <Ctrl>—<W> to activate the Cobra control window.
- 3 Position the cursor beside the diag_util item and type <R> to remove the item.
- 4 Type <Y> to confirm that the utility should be removed.

The ETAS level menu appears.

The Diagnostic Utility Main Menu

The Diagnostic Utility Main Menu lists the following diagnostic utilities:

- HABC, RSM, and Utility card diagnostics (MMP40 only)
- VP card diagnostics
- SCSI diagnostics
- Serial port diagnostics (MSM only)
- Voice path diagnostics
- BootRom diagnostics (MMP40 only)
- Bus Controller SwitchOver diagnostic (MSM only)
- T1 Card diagnostic (MSM only)

Selecting any one of these diagnostics results in a series of prompts which are specific to the selected diagnostic. These prompts are used to collect information to customize the diagnostic execution according to the user's needs. In general the execution can be customized to

- be specific on the hardware that is to be tested
- execute specific test(s) within a diagnostic
- repeatedly execute a diagnostic request
- execute tests which are not normally executed by start-up or out-of-service diagnostics

After collecting all the required information, the corresponding diagnostic program is started on the specified node. Some of the information collected,

is passed on to the diagnostic program where it is used to execute tests only as requested.

After the requests are completed, the diagnostic program sends the result to the utility and then terminates itself. If more than one repetition was requested, the diagnostic program repeats the test with the same set of information. This is done for the number of repetitions requested.

The diagnostics results received by the utility are displayed on the terminal as follows if the diagnostics passed:

```
RETURN: NODE <n> ID <i>  
RESULT: PASSED
```

The diagnostics results received by the utility are displayed on the terminal as follows if the diagnostics fail:

```
RETURN: NODE <n> ID <i>  
RESULT: FAILED  
SUSPECT: <program name> (<number of passes>/<number of execution done>)  
INFO: <cause of the failure>
```

HABC, RSM, Utility Card Diagnostics

This option must be selected when testing the HABC, RSM, or Utility card. The test for all of these cards are supported by the same diagnostic program, TestRBD.

Serial Port Diagnostic

This option supports external loopback testing for any port and internal loopback testing for ports on the MSM 68K card only. The diagnostic program used is TestSerial.

Serial port testing is also supported by TestRBD (internal loopback test for ports on the Utility and RSM card) and TestBRD (internal and external loopback tests for ports on the MMP40 card).

VP Card Diagnostic

This option must be selected when testing VP cards. The diagnostic program used will depend on the platform:

- **TESTVP8** Use for the VP8 and VP4 cards on Modular Option EC systems.
- **TESTVP12** Use for the VP12 or VP12A cards on the MSM.

- **TESTNVP** Use for the NVP32, or NVP16, and GSP cards on Modular Option or Modular Option GP systems.
- **TESTDVP** Use for the DVP card on Card Option systems.

SCSI Device Diagnostic

This option must be selected when testing SCSI devices. Tests are available for both disk and tape devices. The TestSCSI diagnostic program is used.

VoicePath Diagnostic

This option must be selected to test the voice path between Meridian Mail and the switch. The TestVPth diagnostic program is used.

BootRom Diagnostic

This option is only available on MMP40 systems. By selecting this option, Bootrom diagnostics can be executed on MMP40 cards on remote nodes. The TestBRD program supports this capability.

Bus Controller SwitchOver Diagnostic

This option is only available on MSM systems. This option must be selected when testing the bus controller switch-over subsystem. The TestBCSw diagnostic program supports this capability.

T1 Card Diagnostic

This option is only available on MSM systems. This option must be selected when testing the T1 card. The T1D diagnostic program supports these capabilities.

- the name of the program
- some of the options passed to the program
- the number of repetitions left
- the total number of executions completed
- the total number of failures that occurred

Chapter 16: Universal Link Message Analyzer (ulma)

The Universal Link Message Analyzer (ulma) is a monitoring tool designed to monitor the following links:

- ACCESS
- AdminPlus
- AML
- PMSI
- SMDI
- T1
- MSLink

Its purpose is to capture the transferred data, and to assist in debugging configuration problems. It allows Meridian Mail specialists to monitor information remotely via modems, and in some cases may eliminate the need to use a protocol analyzer. It is, however, not a replacement of a protocol analyzer.

Feature limitations

The following is a list of feature limitations:

- Only one link can be monitored within each link monitor at a time, but multiple links can be monitored simultaneously with separate instances of the link monitor.
- Real-time output to the console is limited by baud rate as described in the table below.

Table 16-1
Allowable baud rates

	Allowable baud rates				
ACCESS	n/a	4800	9600	19 200	38 400
AdminPlus	2400	4800	9600	n/a	n/a
AML	2400	4800	9600	n/a	n/a
PMSI	2400	4800	9600	n/a	n/a
SMDI	2400	4800	9600	n/a	n/a
T1	2400	4800	9600	n/a	n/a
MSLink	2400	4800	9600	19 200	38 400

- Light load conditions are advisable, otherwise not all received messages will be displayed. The log files will, however, catch all the transmitted information.
- Only one log file per link is allowed. This should be sufficient because an append option is provided which allows more than one log session to be logged into the log file.
- Setting a view string filter may have serious performance impact on log viewing if the specified string has a low occurrence rate within the logged messages. It takes approximately 30 seconds to search every 1000 messages.
- Scrollback is not provided in view/capture link messages screen.
- ULMA does work with high traffic links when the data is routed to files less than 1 Mbyte. ULMA has a limitation when logging data on high traffic links to very large files (greater than 1 Mbyte) and will lose some of the messages. Message loss occurs on heavily loaded AML links and ACCESS links. It is not expected to be a problem for SMDI, PMSI, or T1 links based on lab results.
- There is no single means to list all current log files, other than by invoking each link monitor.

Using ulma

The Universal Link Monitor can be accessed from the ETAS Level Menu. (ULMA is also available at the TOOLS level, however, the AML link cannot be monitored from there.) At the ETAS level, all supported links can be monitored. Each time ULMA is selected it is forked into a separate window. This allows multiple links to be monitored at the same time using more instances of the Link Monitor.

Note: The maximum number of Link Monitors that can be running simultaneously depends only on the available resources.

Procedure 16-1 **Using ulma**

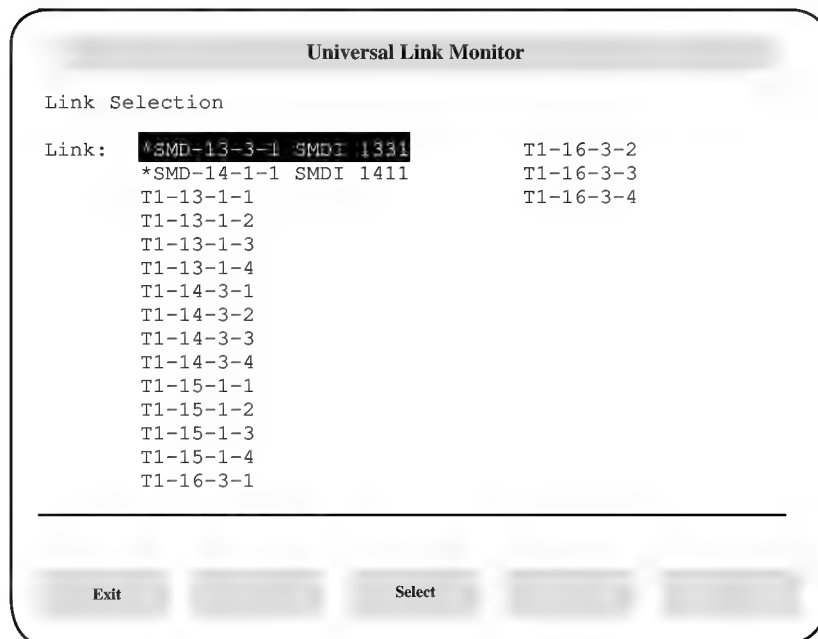
Starting point: ETAS main menu

- 1 Select ulma from the menu.
The Link Selection screen is displayed. See Figure 16-1.
- 2 Position the cursor beside the link you want to monitor.
- 3 Highlight the link.
- 4 Press [Select].
The Universal Link Monitor Menu appears. See Figure 16-2.

Link Selection screen

The Link Selection screen allows the user to select a particular link to monitor. All supported links found on the system will be displayed. Once a link is selected, the Universal Link Monitor Menu appears as shown in Figure 16-2.

Figure 16-1
Link selection screen



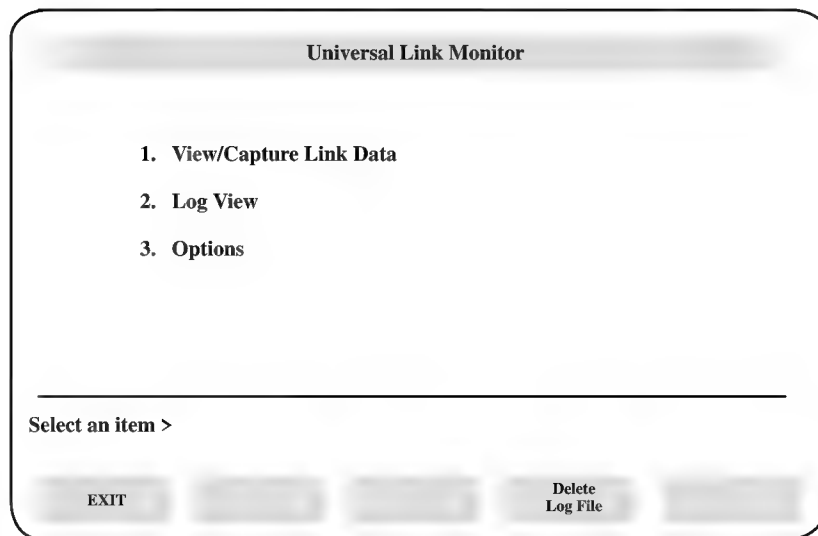
The following softkeys are available:

- **Exit** Terminates the Universal Link Monitor screen and removes its window.
- **Select** Selects the link that is currently highlighted and enters the Universal Link Monitor Menu. An on screen message indicates whether the selected link is down (the link is not responding), or already in use by another Link Monitor instance (The link is already being monitored by another Link Monitor). If the link is down, you will need to select another link.

Universal Link Monitor menu

This menu provides access to link monitoring, log file viewing, and option setting. Once you have selected a link, the Universal Link Monitor Menu appears as shown in Figure 16-2. ULMA is forked into its own window so you can always go back to the MMI by pressing <Control>–<W>.

Figure 16-2
Universal Link Monitor menu



The following options are available:

- **View/Capture Link Data** Enters the “View/Capture Link Data” screen where link messages will be displayed in real-time and can be captured to a log file.
- **Log View** Enters the “Log View” screen where link messages previously captured into a log file can be viewed, searched for, and printed.
- **Options** Enters the “Options” screen where log file related options and other monitoring options can be set.

The following softkeys are available:

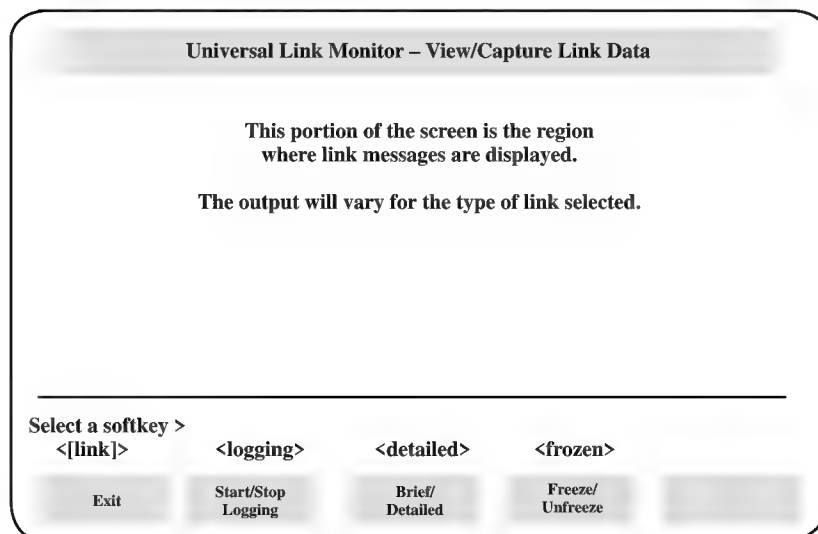
- **Exit** Terminates the Universal Link Monitor Menu session and returns you to the Link Selection screen.

- **Delete Log File** Delete the existing log file for the currently selected link. If a log file doesn't exist for the link, the softkey will not be shown.

The View/Capture Link Data screen

This screen allows you to view link messages in real time and captures them if desired. The link messages can be displayed either in brief or detailed format. Once you select the View/Capture Link Data option from the Universal Monitor Menu, the View/Capture Link Data screen appears as shown in Figure 16-3.

Figure 16-3
View/Capture Link Data screen



On this screen <[link]> denotes where the currently selected link name and hardware TN appears. This value is composed of the link type name and link hardware location. In addition to the <[link]> status item, three other items appear namely <logging>, <detailed>, and <frozen>. These items will always appear regardless of the link type.

- **<[link]>** The currently selected link name and hardware TN. The format is the link type name, followed by a hyphen (-), followed by the link hardware location (node #-card #-port #).

- **<logging>** This status item appears if logging is in progress. This status may be changed by using the [Start/Stop Logging] softkey. Initially logging is not active and the <not logging> status item appears.
- **<detailed>** This status item indicates whether the detailed message output format is active which means that all message information is visible. This status may be changed by using the [Brief/Detailed] softkey. The default mode is <brief> which means messages are displayed in a one line per message format.
- **<frozen>** This status item indicates that the display does not show any new link messages and the scrollbar is disabled. This status may be changed by pressing the [Freeze/Unfreeze] softkey. The default mode is <viewing>.

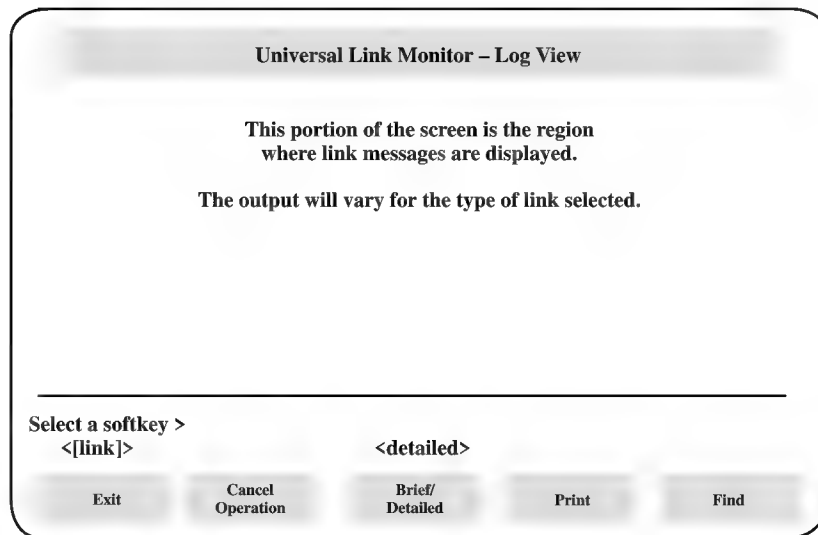
The following softkeys are available:

- **Start/Stop Logging** Toggles the log to disk process.
- **Brief/Detailed** Toggles between the brief and detailed output formats.
- **Freeze/Unfreeze** Toggles displaying of new messages on the screen. When the display is unfrozen, messages that occur while frozen will not appear on the screen.
- **Exit** Return to the Universal Link Monitor menu. If link message capturing was in progress, it is stopped.

The Log View screen

This screen allows you to view and print previously logged link messages. When the Log View screen option is entered, messages from the beginning of the log file are displayed. You can then scroll through the messages, search for a specified message, or print a sequence of messages. The output format can also be specified.

Figure 16-4
Log View screen



Notice that in addition to the <[link]> status item one other item appears namely <detailed>. These items will always appear regardless of the link type. If there are more messages than the screen can accommodate, you can move up or down one screen at a time, by pressing the up and down arrow keys.

- **<[link]>** The currently selected link name and hardware TN. The format is the link type name, followed by a hyphen (-), followed by the link hardware location (node #-card #-port #).
- **<detailed>** This status item indicates whether the detailed message output format is active which means that all message information is visible. This status may be changed by using the [Brief/Detailed] softkey. The default mode is <brief> which means messages are displayed in a one line per message format.

The following softkeys are available:

- **Cancel Operation** Cancels the previous or next page and Find log repositioning operations if they are in progress.
- **Brief/Detailed** Toggles between the brief and detailed output formats.
- **Print** Prints a specified number of link messages to the printer or screen.
- **Find** Searches for a string within the link messages.
- **Exit** Returns to the Universal Link Monitor menu.

Log View Screen-Print option

The Print option is selected from the Log View screen via the [Print] softkey. You are then prompted for the number of messages to print starting from the message displayed at the top of the screen. Once printing is completed or interrupted, log viewing is resumed.

If you want to print, press the [Print] softkey and enter the number of messages to be printed at the “Number of Messages to Print” prompt. (The range is from 1 to 99 999 and the default is 100.)

The following softkeys are available:

- **Cancel** Cancels the selected print operation and returns you back to log viewing.
- **Print to Console** Prints the entered number of messages to the ULMA display in a continuous mode.
- **Print to Printer** Prints the entered number of messages to the SEER, or reports, printer. While printing is in progress, access to other link monitors or MMI is not possible.

You can cancel printing at any time.

Log View Screen-Find option

The Find option allows you to search for a specific string within a log message. This is useful because searching for a specific time, message type, DN number, or direction can be done. Once the find operation is completed log viewing is resumed at the “found” position in the log.

If you want to find a string, press the [Find] softkey and enter the search string at the “Search Expression” prompt. Case does not matter.

Search expressions can be built up using the following three logical operators:

- the exclamation mark (!) which means “not”
- the ampersand (&) which means “and”
- the vertical bar (|) which means “or”

For example, on an AML system, you can search for everything except the poll messages with the search string “!poll”. You can search for time requests with the string “time & request”.

The following softkeys are available:

- **Find** Begins the search. The search can also be started by pressing the <Return> key.
- **Cancel** Cancels the selected find operation and returns you back to log viewing at the interrupted search position.

The Options screen

The Options screen allows you to set log file related options and other monitoring options.

Figure 16-5
Options screen

Universal Link Monitor

Options

Space Available (kB): 11076

Log File Size (kB) : 100

View Filter Expression : _____

Select a softkey >

Save Cancel [] [] []

The following status fields are displayed:

- **Space Available** Read-only field. It shows the amount of free space on the volume where the log files are stored.
- **Log File Size** Specifies the maximum size that the log file can be. Once this file size is reached and logging continues, the oldest logged messages are deleted as new ones are logged.

The file size can range from 10 Kbytes to 4500 Kbytes, with a default value of 100 Kbytes.

- **View Filter Expression** Specifies the string filter to be used when viewing messages. If a string is specified in this field, only link messages containing that string will be shown during a real-time or log view sessions. The string can contain the same logical operators as for log file searching: the exclamation mark (!) meaning “not,” the ampersand (&) meaning “and,” and the vertical bar (|) meaning “or.” For example, AML poll messages can be suppressed with the string “!POLL.”

The view filter expression is empty by default and can be a maximum of 40 characters.

The following softkeys are available:

- **Save** Stores the newly selected options for further capture operations. The changes are, however, not permanent. They will be reset to their defaults once the program is exited and reentered.
- **Cancel** Discards any changes made to the options, and sets them back to what they were prior to entering the Options menu.

Link messages

The following list outlines the various link messages which are displayed in the brief output format:

- **Timestamp area** Title line contains the date portion of the timestamp. Each message contains its log time which is accurate to centiseconds.
- **Delta time difference** Title line contains the time difference (TDiff) area. Each message contains a delta time difference corresponding to the time taken to send the message. This area is PMSI specific.
- **Message direction area** Title line shows the names of devices connected to the link (for example MM, PBX etc). The PMSI link shows three devices. Each link message contains an arrow indicating the direction of flow between any two devices. In AML, SMDI and TI links, this area also contains the message type. This area contains the API names for the ACCESS, ADMINPlus, and MSLink.
- **Error Area** Title line labels the Error area. Any errors detected in the message will be shown here. This area is PMSI specific.
- **Data area** Title line labels the Data area. Any additional message data is shown here.

The following is a list of messages which appear in the detailed message output format:

- **First line** This line consists of a timestamp, log date, message direction and message type (or API name).
- **Date line** This line is available for some of the links and contain the same information as the data area in brief message format.
- **Raw data line** Raw message dump allows you to view the entire message in a raw format.
- **Last line** This line gives a detailed description of the message function.

Chapter 17: RSM Maintenance Utility (rsm_util)

The RSM package is written to test the RS-232 Service Module (RSM) interface routines and utilities. The RSM module must be present on the selected node.

System dependencies are as follows:

- DMS Voice Mail – not present
- Classic Meridian Mail – optional
- Option 11 – optional
- Enhanced Capacity (EC) – always present as part of Utility Pack

The following commands are available:

- RSMNODE—set node for RSM commands
- RSMSTARTPORT—start RSM port test
- RSMENDPORT—end RSM port test
- RSMGETTIME—get current time
- RSMSETTIME—set current time
- RSMINT—set RSM interrupts to Enable(1)/Disable(0)
- RSMLED—set RSM LED to on(1)/off(0)
- RSMLEDSTAT — displays RSM LED status
- RSMMINALARM—set Minor Alarm on(1)/off(0)
- RSMMAJALARM—set Major Alarm on(1)/off(0)

- RSMCRTALARM — set Critical Alarm on(1)/off(0)
- RSMALARMSTAT — displays RSM alarm status
- RSMREADPERM—read battery-backed data
- RSMWRITEPERM—write battery-backed data
- RSMREGS—display RSM register status
- RSMSETMODEM — Turn on/off EC utility card modem (EC systems only)

Commands

RSMNODE

If there is more than 1 RSM card in a multi-node system, sets the RSM card node number. All RSM package commands will then be directed to this node's RSM card. If the number is not set, the RSM commands will be directed to the node where the RSM package is loaded.

RSMSTARTPORT

The RSMSTARTPORT command starts the driver task on the required ports at the given baud rate. The first parameter is the terminal baud rate for this test. The command then accepts port names (maximum of five) as command parameters. If the command is entered without the parameters, the user will be prompted for the baud rate followed by the required port names. Enter "" (null string) to indicate the end of the port name parameters if the number of parameters is less than five. If you don't end the list with a null string, then the system will prompt for the remaining port names up to the maximum of five port names.

To start the driver task for ports MOD0183 and MOD0184 with baud rate 19200, enter:

```
rsmstartport 19200 MOD0183 MOD0184 ""
```


RSMENDPORT

The RSMENDPORT command will terminate the driver task running in the required ports. The command also accepts port names as the command parameters. If the command is entered without the parameters the user will be prompted for the required port names (the default names will be the port names that you entered with the RSMSTARTPORT command). Enter "" to indicate the end of the port name parameters if you have entered less than five port names.

To end the driver task for ports MOD0183 and MOD0184, enter:

rsmendport MOD0183 MOD0184 ""

For the RSMENDPORT and RSMSTARTPORT commands to perform properly, the following hardware and software installation is expected.

- The system should be equipped with an RSM card and the RSM card cables should be connected to RS-232 terminals using modem connections.
- The hardware database "dataport" components should be defined with data type = hd_termdata and named port1, port2, port3, port4, and port5. Port1 is normally used for the CSL port and can be defined as datatype = hd_CSLdata and the name can be left blank. The system should be restarted after the hardware database is redefined.

RSMGETTIME

The RSMGETTIME command reads and prints the current time which is maintained by the RSM card clock. This command has no parameters.

RSMSETTIME

The RSMSETTIME command will set the RSM card clock time to the user designated time. The time is designated using parameters.

For example, enter:

rsmsettime 89 1 11 15 30 30

to set the RSM clock time as

Year 89
Month 01 (January)
Date 11
Time 15 (24 hour clock 3PM)
Minute 30
Second 30

Note: For the year 2000, set the “Year” as 00.

RSMINT

This command enables (1) and disables (0) interrupts from the RSM card.

To enable interrupts from the RSM card, enter:

rsmint 1

To disable all interrupts from the RSM card, enter:

rsmint 0

RSMLED

This command turns the LED indicator on the front of the RSM board ON (1) and OFF (0):

rsmled on

rsmled off

RSMLEDSTAT

This command displays the current RSM LED status.

RSMMINALARM

This command turns the Minor Alarm device provided by the RSM board ON (1) and OFF (0).

rsmminalarm on

rsmminalarm off

RSMMAJALARM

This command turns the Major Alarm device provided by the RSM board ON (1) and OFF (0).

rsmmajalarm on

rsmmajalarm off

RSMCRTALARM

This command turns the Critical Alarm device provided by the RSM board ON (1) and OFF (0).

rsmcrtalarm on

rsmcrtalarm off

RSMALARMSTAT

This command displays the current alarm status.

RSMWRITEPERM

This commands writes data given by the user in the battery-supported memory of the RSM card. Up to 50 bytes of data can be written into this memory.

RSMREADPERM

This commands prints out the data in the battery-supported memory of the RSM card.

RSMREGS

This command displays the current status of RSM registers.

RSMSETMODEM

This command turns the EC utility card modem (EC systems only) ON or OFF.

rsmsetmodem on

rsmsetmodem off

ATTENTION

This utility should not be used during an active remote access session.

Chapter 18: SCSI Utility (scsi_util)

This utility contains diagnostic tools for small computer system interface (SCSI) disk and tape drives. It should not be used on a live system.

About disks

A SCSI disk drive may be viewed as a set of 512-byte blocks. Blocks are numbered consecutively starting from 0. The disk controller handles the mapping of sectors to blocks. During the life of a disk, the sector associated with a block may change as a result of reassignment.

At the next level, disk space is partitioned into regions. Region 0 contains the operating system. Region 1 holds the file system. The starting positions of the regions are:

System	Region 0	Region 1
non-Option 11	32	2032
Option 11	2	1400

Region 1 begins immediately after region 0 and runs to the end of the disk.

At the next level, disk space within the file system region is divided into volumes. There are two types of volumes, text and voice, which allocate space in 1 Kbyte and 8 Kbyte units, respectively.

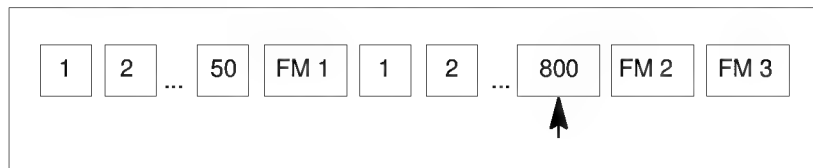
The **list** command in vsmup may be used to list the names, starting locations, and sizes of volumes within the file system region. If **list** gives a volume's starting location as x , the volume occupies a sequence of disk blocks starting at block $2x$ of the region. If the volume is a text volume of size y text blocks, it will take up the next $2y$ disk blocks. If the volume is a voice volume, it will take up the next $16y$ disk blocks.

About tapes

A cartridge written by an SCSI 1/4-inch tape drive may be viewed as sequences of 512-byte blocks separated by filemarks. The position of a block is given by a pair of numbers (x, y) , where x is the number of filemarks between the beginning of tape and the block, and y gives the position of the block relative to the last filemark before it.

For example, consider the tape layout shown in Figure 18-1.

Figure 18-1
SCSI tape layout



The first block on the tape is at position (0,1). The block marked with an arrow is at position (1,800).

Physically, blocks and file marks are written in tracks that run back and forth along the length of the tape. The number of tracks that can be fitted across a tape depends on both cartridge type and the tape drive that is doing the writing. When writing, the Viper 2150S will maximize the number of tracks as follows:

DC600A	15 tracks
DC6150	18 tracks
DC6250	18 tracks

The Tandberg 4220 drive will maximize the number of tracks as follows:

DC600A	15 tracks
DC6150	18 tracks
DC6250	18 tracks
DC6525	26 tracks
DC9100	30 tracks
DC9200	42 tracks

When reading, the tape drives will adapt to the number of tracks on the tape. Certain tape drive-cartridge combinations will not work. For example, a DC9200 (or Magnus 2.0) cartridge written by a Tandberg 4220 cannot be

read on a Viper 2150S. As another example, the Viper 2150S or Tandberg 4220 cannot be used to write a DC300XLP cartridge.

Exception reports

Disk exception

device d> sense key: k error code: e [block: b]

In all SCSI devices, sense keys encode exception type as follows:

- 0 ok
- 1 recovered error
- 2 not ready
- 3 medium error
- 4 hardware error
- 5 illegal request
- 6 unit attention
- 7 data protect
- 8 blank check

Sense keys 3 and 4 indicate some form of hardware problem. Sense key 5 arises when scsi_util tries to access an unsupported feature. Sense key 6 comes up after a reset.

Error codes give more specific information about an exception. Their interpretation is disk drive dependent.

Tape exception

device d> sense key: k [residue: r]

Sense key 6 comes up after cartridge insertion, as well as after device reset.

Sense key 7 is the result of attempting to alter the contents of a write-protected cartridge. Sense key 8 indicates the end of recorded data.

General exceptions

device d> timeout -> bus reset

This message indicates that scsi_util was unable to determine the outcome of a command that it sent out to a device.

device d> driver error: x

x can take on the following values:

- 129 selection timeout
- 130 unexpected disconnect
- 131 bus reset

132 parity error
133 timeout

General commands

Most `scsi_util` commands apply to only one or two types of devices. The device types of a command and of the currently-selected device must match; otherwise the command will be rejected. General commands are an exception; they can be used regardless of device selection.

node

This command prints out the ordinal number of the node on which `scsi_util` is running.

reset *bus*

This command resets all devices on the SCSI bus. On non-SPM systems, there is only one bus, 0. On SPMs, there are two buses, 0 and 1.

scsi on/off

This command is used to switch `scsi_util` on and off. Loading the package merely brings it into memory; it still has to be turned on prior to use. The package should be turned off before it is unloaded to free up the resources it was using.

select *x*

This command selects the device at SCSI address *x* as the target for further commands. If no address is given, it returns the current selection.

selftest

This command makes a device perform its own built-in diagnostics. Usually these diagnostics only exercise the device's electronics and do not involve any medium access.

Disk commands

The following commands can be used only with disk drives.

copy *src dst blki blkf*

This command copies blocks *blki* to *blkf* from disk *src* to disk *dst*. It is able to skip over bad blocks in the source disk, and can be used to clone disks in emergencies. It can also be used as a read-write test if *src* and *dst* are equal.

ATTENTION

Do not use this command on a live system.

Do not use this command to synchronize disks for disk shadowing.

Do not copy blocks 0 and 1 on a disk-shadowed system.

defects *option*

This command displays information about defective sectors that were mapped out. There are four options:

- ***count*** Displays number of sectors mapped out.
- ***grown*** Lists sectors mapped out after leaving the factory.
- ***primary*** Lists sectors mapped out before leaving the factory.
- ***combined*** Lists all sectors that were mapped out.

format

This command reformats the disk. This operation causes the loss of any data stored on disk. Format provides an opportunity to back out with the following reminder and request for confirmation:

Formatting will cause the loss of all data on disk.
Do you still want to reformat?

SCSI disk drives always come formatted from the factory. When blocks become unreadable or unwriteable and cannot be reassigned, reformatting is often an alternative to disk replacement.

If the format is interrupted, the disk may reject all subsequent medium access requests with the following error:

sense key: 3 error code: 49

This state may be cleared by reformatting. If this error occurs when selecting a disk, the format command may still proceed.

ATTENTION

Do not use this command on a live system.

modesen *option*

This command displays a disk's operating parameters in the form of a hex dump. Related parameters are grouped together in pages; modesen provides the following options for viewing a page:

- ***current*** Displays current version of page in disk controller memory.
- ***changeable*** Displays map of page bits that may be changed.
- ***default*** Displays default version of page.
- ***saved*** Displays version of page saved on disk.

Disk drives vary in the pages they support as well as in their interpretation of individual parameters.

motor on/off

This command is used to turn the disk spindle motor on or off.

read *blk n*

This command displays the contents of blocks *blk* to *blk + n - 1* in the form of a hex dump.

reassign *blk0 blk1 ...*

This command takes a list of blocks and assigns new sectors to them (if the list is empty, reassign does nothing). Blocks should be entered on the list in ascending order by address.

ATTENTION

Do not use this command on a live system.

Reassign may fail for two reasons:

- Sense key 3, error code 17. While trying to reassign a block on the list, a different block was found to be unreadable. If that block is not on the list, add it to the list and try again.
- Sense key 3, error code 50. An appropriate spare sector cannot be located.

size

This command displays the size of the disk in blocks.

verify *blki blkf* yes/no

This command checks that the data and redundant bits in blocks *blki* to *blkf* are consistent. The default values for *blki* and *blkf* cover the entire disk.

Verify will either go through all requested blocks or stop on the first error depending on whether the third parameter is yes or no.

Tape commands

The following commands work only with tape drives. All tape commands require that a cartridge be in the tape drive and will prompt you to press a key when the tape is ready. Ensure that the tape has stopped moving before pressing a key.

erase

This command erases a cartridge. Since any data on the cartridge will be lost, erase provides an opportunity to back out with the following reminder and request for confirmation:

Erasing will cause the loss of all data on this cartridge.
Do you still want to erase?

read *fm blk n*

This command displays the contents of blocks (*fm, blk*) to (*fm, blk + n - 1*) in the form of a hex dump.

Multiple reads can be issued to a tape. Scsi_util will try to minimize the amount of time spent positioning the tape.

retension

This command forwards to the end of the tape and then rewinds it. The time required depends upon the tape length, and varies from two to four minutes.

rewind

This command rewinds the tape.

verify

This command checks that the data and redundant bits in every block on tape are consistent. There are three possible outcomes:

- **Pass** Every block can be read, possibly with retries.
- **Fail** One or more blocks cannot be read. Scsi_util reports the position of these blocks as they are encountered.
- **Blank tape** The tape is blank.

Scsi_util also reports the total number of retries, or soft errors, in the process.

Notes on scsi_util

The following must be considered when using scsi_util with some disk and tape drives in Meridian Mail.

- 5.25 inch 150 Mbyte or 300 Mbyte Seagate disk drives do not support the “motor” command. Furthermore, only one bad block can be reassigned at a time. If a second bad block is discovered during reassignment, neither block can be reassigned.
- The DC9100 and DC9200 cartridges are not compatible with the Viper 2150S.
- A DC6525 cartridge written by a Viper drive will contain a maximum of 250 Mbytes of data (not 525 Mbytes).
- A DC6525 cartridge written by a Tandberg drive cannot be read by the Archive Viper.
- The DC6150 and DC6250 tapes can be interchanged between the Viper and Tandberg drives.

18-10 SCSI Utility (scsi_util)

Chapter 19: MISA Cabinet Utility (md_cm)

This chapter describes the functions provided by the md_cm utility program. Md_cm allows users to exercise almost all of the Cabinet Manager's capabilities. Md_cm also provides additional utilities to assist users to set up structures before calling certain CM functions.

**CAUTION****Risk of data loss**

This utility is intended for users with expert knowledge of the Cabinet Manager and the DD component of the MISA file system. Misuse of this utility can be destructive.

Running md_cm

Procedure 19-1
Starting md_cm

Starting point: The ETAS menu

- 1 Select "Other" from the ETAS menu.

A secondary menu is displayed.

- 2 Select "md_cm".

You can now select the md_cm Virtual Terminal from the Cobra Virtual Terminal by pressing <Ctrl>-<w>.

Md_cm public variables

Md_cm has some global variables that can be set before certain functions that use the variables are called.

FIR

Md_cm provides a FIR array of 10 elements with an index ranging from 0 to 9 for storing FIR information. When supplying a FIR parameter to a function, the index to the array is specified instead of the whole FIR structure. If the FIR index is not specified in the command line, a default index is used by the function. At startup, the default index is 0 (zero). However, the default FIR index can be changed by using the **cmSetFir** command. The values of the FIR array is initialized to cm_NilFIR.

FCB

Md_cm allows users to open up to 10 files at any one time. The open file FCBs are stored in an FCB array of 10 elements with an index ranging from 0 to 9.

When supplying a FCB parameter to a function, the index to the FCB array is specified. If the FCB index is not specified in the command line, a default index is used by the function. At startup, the default index is 0 (zero). The default FCB index can be changed by using the **ddSetFCB** command. Once an FCB index is used, it cannot be used again until the opened file with the FCB index is closed or destroyed. For more information on FCB, refer to the DD component of the MISA file system. The values of the FCB array are initialized to dd_NilFCB.

CCB

Md_cm allows users to open up to 10 cabinets at any one time.

The open cabinet CCBs are stored in a CCB array of 10 elements with an index ranging from 0 to 9. When supplying a CCB parameter to a function, the index to the CCB array is specified. If the CCB index is not specified in the command line, a default index is used by the function. The default at startup is 0 (zero) which can be changed by using the **ddSetFCB** command.

When a cabinet is opened, an FCB array element corresponding to the CCB index is used to store the cabinet's FCB value. Therefore, the FCB element cannot be used to store another open file's FCB until the cabinet is closed. Similarly, once a CCB index is in use, it cannot be used again until the cabinet with the CCB index is closed. The values of the CCB array are initialized to cm_NilCCB.

RetInfo

Md_cm provides a variable of type “cm_tRetInfo” for the users to set, and the variable is passed to all functions that require a “cm_tRetInfo” type variable (for example, cmrFiltersToFIR). The content of the variable is set by the command **cmSetRetInfo**. This parameter cannot be specified in the command line of the functions that use it. The value of this variable is initialized to the CM default except that the UpdtStart field is set to TRUE.

AutoFill

Md_cm provides a variable of type “cm_tAutoFill” for the users to set, and the variable is passed to all functions that require a “cm_tAutoFill” type variable (for example, cmAddFile). The content of the variable is set by the command **cmFillAdvice**. This parameter cannot be specified in the command line of the functions that use it. The value of this variable is initialized to all TRUE.

Filter

Md_cm provides a variable of type “cm_tFilters” for the users to set, and the variable is passed to all functions that require a “cm_tFilters” type variable (for example, cmrFiltersToFIR). The content of the variable is set by the command **cmSetFilters**. This parameter cannot be specified in the command line of the functions that use it. The value of this variable is initialized to cm_NilFilters

Open Advice

Md_cm provides a variable of type “dd_tAdvice” for the users to set, and the variable is passed to all functions that require a “dd_tAdvice” type variable (for example, cmOpenCab). The content of the variable is set by the command **cmAdvice**. This parameter cannot be specified in the command line of the functions that use it. The value of this variable is initialized to the CM default.

Md_cm utilities

The value range for CCB, FIR, and FCB # is 0 to 9. If CCB, FIR, or FCB index is not specified, the corresponding default index is used. The “[” and “]” characters have to be entered as shown if the CCB parameter is to be specified in the command line.

cmAddCab [CCB #] <FIR #> <cab type> <client ID>

Creates and adds a new cabinet to an opened cabinet.

- The FIR.Core.FID must be NIL.
- The FIR.Core.Name is optional but desirable if the cabinet is to have a name.
- Commands that may have to be invoked before calling this function:
cmFillAdvice

cmAddFile [CCB #] <open file FIR #> <open file FCB #>

Adds an opened file to an opened cabinet.

- The open file FCB must be provided in order to update the reference count or a problem will occur when the FIR is removed later.
- Commands that may have to be invoked before calling this function:
cmFillAdvice

cmAddToMenu [CCB #] <sort pos> <FIR #>

Adds a FIR to an opened menu.

- cmOpenMenu must be called first or a memory fault will occur.

cmAdvice <memory sizes> <suggested file size> <paging allowed>

Sets open file advices.

cmCabInfo [CCB #]

Retrieves information about an opened cabinet.

cmCabTimestamp [CCB#]

Returns the cabinet time stamp value.

cmChgMode [CCB #] <mode>

Changes the read/write mode of the opened cabinet.

cmChgOpenRights [CCB #] <right>

Changes the open rights of the opened cabinet.

cmChgOwner [CCB #] <client ID>

Changes the owner ID of the open cabinet.

cmChgSbmBxCtr [CCB #] <# of entries>

Increases or decreases the number of submailbox counter entries in a cab.

cmCloseCab [CCB #]

Closes an opened cabinet.

- Menu, if opened, must be closed first or the heap used by menu will be lost.

cmCloseMenu [CCB #]

Closes an opened menu associated with an opened cabinet.

- **cmOpenMenu** must be called first or a memory fault will occur.

cmControl [CCB #] <control ops>

Sets the control options.

cmCopyFile [src CCB #] <open file FCB #> <open file FIR #> <target CCB #>

<new owner>

Copies a file/cabinet from a cabinet to another/same cabinet.

- The open file FCB # can be an index to a NIL FCB.
- The FIR.Core.FID will be updated with the new file's FID, but the original file's FID must be passed into the function.
- Commands that may have to be invoked before calling this function:
cmFillAdvice.

cmCounters [CCB #]

Retrieves the main mailbox's internal counters.

cmDFir <FIR #>

Displays a FIR structure.

cmSExCounters

Sets external message counters buffer.

cmFillAdvice <client ID> <time stamp> <no. of blocks>

Sets the autofill advices.

cmFlushMenu [CCB #]

Flushes an opened menu associated with a cabinet.

- cmOpenMenu must be called first or a memory fault will occur.

cmGetFid <start FID> <path>

Gets FID of a file relative to the cabinet given in <start FID>.

- If the path is a full path name, the <start FID> is not used.

cmInsertFile [CCB#] <FIR #> <file FCB #> <insert index>

Inserts a file to a cabinet.

cmMenuSize [CCB #]

Retrieves the size of an opened menu associated with an opened cabinet.

- cmOpenMenu must be called first or a memory fault will occur.

cmMenuToFir [CCB #] <target pos> <scope> <return FIR index>

Retrieves a FIR from a menu element associated with an opened cabinet.

- cmOpenMenu must be called first or a memory fault will occur.

cmMoveFile [src CCB #] <target CCB #> <open file FCB #> <FIR #>

Moves a file/cabinet and its FIR from a cabinet to another/same cabinet.

- The open file FCB # can be an index to a NIL FCB.
- Only the FIR.Core.FID and FIR.Core.Name are significant. All other fields in FIR.Core will be updated when moved.
- Commands that may have to be invoked before calling this function:
cmFillAdvice.

cmNewFir [CCB #] <FIR #> <scope>

Retrieves the most up-to-date FIR information from an opened cabinet.

- Only the FIR.Core.FID and FIR.Core.Name are significant.

cmOpenCab [CCB #] <cab name/FID> <mode> <client ID> <rights>

Opens a cabinet for all subsequent cabinet operations.

- If mode is RC, it will be automatically upgraded when write mode is required.
- Commands that may have to be invoked before calling this function:
cmAdvice.

cmOpenMenu [CCB #] <sort order> <split pt>

Opens a menu associated with an opened cabinet.

- ascending order in the core record (not really date)
- descending order in the core record (not really date)

cmQueryCounters [CCB#]

Returns the number of counter entries in a cabinet.

cmRFiltersToFir [CCB #] <return FIR #> <scope>

Retrieves a FIR based on the filter and retinfo.

- Commands that may have to be invoked before calling this function:
cmSetFilters and **cmSetRetInfo**.

cmRmvFile [CCB #] <open file FCB #> <open file FIR #>

Removes a file/cabinet from a cabinet.

- The FIR must have been retrieved earlier with **cmRFiltersToFIR**.
- The FIR.Core.FID must contain the open file FID.
- The open file FCB # can be an index to a NIL FCB and the reference count will be automatically decremented.
- If the open file FCB is provided, it will be reset to NIL.

cmRmvFromMenu [CCB #] <target pos>

Removes an element from an opened menu associated with an opened cabinet.

- **cmOpenMenu** must be called first or a memory fault will occur.

cmSetFilter <Nil Filters>

Sets filter for file retrieval.

If the <Nil Filters> parameter is set to "No," then no further parameters are accepted.

Otherwise, the following parameters are available with the **cmSetFilter** command:

<Nil Filters> <FID> <Names> <Class> <Rights> <Include Deleted>
 <Include Private> <Include Printed> <Include Urgent> <Include Incoming>
 <Include Altered> <Exclude Deleted> <Exclude Private> <Exclude Printed>
 <Exclude Urgent> <Exclude Incoming> <Exclude Altered> <SubClasses>

<Serial Number> <Include Partial Receive> <Exclude Partial Receive> <Subject>
<Min Creation Date> <Max Creation Date> <Min Update Date>
<Max Update Date> <Creator> <Updater> <Principal Name> <Submailbox>
<Class Specific 2> <Class Specific 3> <Include Live> <Exclude Live>
<Include Should RN> <Exclude Should RN>

cmSetFir <new FIR #>

Sets the current FIR index to be used if not given in parameter.

cmSetRetInfo <start pos> <direction> <ignore> <updtstart>

Sets file retrieval info.

cmSFir <FIR #> <scope>

Sets FIR values.

<Scope> can have four possible values:

- EntireFir
- CoreOnly
- SecOnly
- AutoFillOnly

The use of these parameters is explained below.

If the <Scope> is entered as “EntireFir”, then the following parameters are available:

<FIR #> <Scope> <FID> <Name> <Class> <Deleted > <Private> <Printed>
<Urgent> <Incoming> <Altered> <Tagged> <Rights> <Subclass>
<Serial Number> <Partial received> <Date Created> <Creator>
<Date Updated> <Updater> <Principal Name> <Voice Blocks>
<Text Blocks> <Submailbox> <CISpec2> <CISpec3> <Live> <Redirected>
<Undirected> <Should RN> <NtwkBest>

If the <Scope> is entered as “CoreOnly,” then the following parameters are available:

<FIR #> <Scope> <FID> <Name> <Class> <Deleted > <Private> <Printed>
<Urgent> <Incoming> <Altered> <Tagged> <Rights>

If the <Scope> is entered as “SecOnly,” then the following parameters are available:

<FIR #> <Scope> <Subclass> <Serial Number> <Partial received>
 <Date Created> <Creator> <Date Updated> <Updator> <Principal Name> <Voice
 Blocks> <Text Blocks> <Submailbox> <ClSpec2> <ClSpec3> <Live>
 <Redirected> <Undirected> <Should RN> <NtwkBest>

If the <Scope> is entered as “AutoFillOnly”, then the following parameters are available:

<FIR #> <Scope> <Subclass> <Serial Number> <Partial received>
 <Date Created> <Creator> <Date Updated> <Updator> <Principal Name> <Voice
 Blocks> <Text Blocks> <Submailbox> <ClSpec2> <ClSpec3> <Live>
 <Redirected> <Undirected> <Should RN> <NtwkBest>

cmSubCounters [CCB #] <submailbox #>

Gets submailbox counters information.

cmTidyCabinet [CCB #] <physical?>

Deletes or remove files/FIRs from an opened cabinet.

cmUpdExCounters [CCB #] <submailbox #>

Updates submailbox’s external message counters.

cmUpdtFile [CCB #] <open file FCB #> <open file FIR #> <scope>

Updates a file/FIR with the latest value specified.

- openfile FCB number can be an index to a NIL FCB
- Commands that may have to be invoked before calling this function:
cmFillAdvice

cmUpdtMenu [CCB #] <target pos> <remove?> <FIR #>

Updates an element in an opened menu associated with an open cabinet.

- cmOpenMenu must be called first or a memory fault will occur

19-10 MISA Cabinet Utility (md_cm)

Chapter 20: Message Transfer Utility (md_mt)

The md_mt utility allows you to access the following functions:

- MTDUMPMSG
- MTONLINE
- MTOMGET

These functions/utilities are explained in this chapter. The md_mt utility can be accessed through the ETAS Level Access menu, as described in Chapter 1, “Introduction.”

MTDUMPMSG

MTA Display Message Internal Content Utility

Syntax: **MTDUMPMSG message—filename**

It displays the internal contents of a message which includes both sender and recipient information such as sender's/recipient's name, department, site identification, location identification, mailbox number and address type, the type of message, the delivery time, and any attachments.

Error messages

An error message will be returned in the following situations:

- Fails to get recipient's record
- Record length is incorrect
- Reading address fails

Example of how to access an error message:

- 1 After accessing md_mt through the ETAS menu, you must move to the appropriate directory, find the user's cabinet, and list the messages to see the message filenames, as follows:

cd /<user's volume>/users

ls (list directory contents to find the cabinet name)

cd /<cabinet name>

A user's cabinet name consists of four letters followed by the mailbox number (for example, Smit8050).

ls (list message filenames)

Message filenames consist of a letter (v, m, f, s, or r) followed by 12 digits (that is, the date).

- 2 To allocate memory, type: **heap 50**
- 3 To display the message, type: **mtdumpmsg <message filename>**
where "filename" is name of the file (for example, V021090091010).

MTONLINE

MTA Volume Register Information Utility

Syntax: **MTONLINE volume-number**

MTONLINE checks if a specific volume is registered by MTA (that is, it checks if there is an active MTA in that specific volume). Nothing is displayed if an MTA is registered on the specific volume. Otherwise, "Not OK" is displayed.

Example:

- 1 Access the md_mt utility through the ETAS menu, as described in Chapter 1.
- 2 To check if a volume 2 is registered type: **mtonline 2**

MTOMGET

MTA Operational Measurement (OM) Utility

Syntax: **MTOMGET [Y / N]**

MTOMGET lets you retrieve all of the MTA's OM data or clear the MTA's data.

MTOMGET N clears all MTA operational measurement data.

MTOMGET Y gives you the option of skipping or reading basic OM data, voice message OM data and NMTA OM data. OM data is collected from the beginning of the day or the time when you perform a clear OM operation.

Error messages

"Not OK" is displayed if the utility fails to get the OM data.

Example:

- 1 Access the md_mt utility through the ETAS menu, as described in Chapter 1.
- 2 To get MTA OM report, type: **mtomget N**

Descriptions of important MTA OM data:

Message	Meaning
Msgs waiting	The total number of messages waiting to be delivered.
Deferred	The total number of deferred messages (e.g., timed delivery messages) waiting to be delivered.
Dlv Tasks crashed	The total number of delivery tasks crashed.
Received	The total number of messages received by MTA.
Corrupted	The total number of bad/corrupted/lost messages.
Regular	The total number of standard messages delivered by MTA.
—continued—	

20-4 Message Transfer Utility (md_mt)

Message	Meaning
Economy	The total number of economy messages delivered by MTA.
Urgent	The total number of urgent messages delivered by MTA.
Ack	The total number of acknowledgements delivered by MTA.
Ndn Div (User)	The number of non-delivery notifications caused by user error.
Ndn Div (corrupt)	The number of non-delivery notifications caused by message corruption.
Ndn Div (system)	The number of non-delivery notifications caused by system error.
Length (kb) Avg	The average length of messages.
Length (kb) Max	The length of the longest message.
Length (kb) Min	The length of the shortest message.
Recipients (Avg)	The average number of recipients per message.
Recipients (Max)	Compares the number of recipients each message addresses to; this is the largest number
Recipients (Min)	Compares the number of recipients each message addresses to; this is the smallest number.
—end—	

Chapter 21: Database Synch Utility (is_patch)

This utility checks and optionally corrects mismatches between the Organization Directory database and the users in the system. To sync the Organization Directory and voice services, use VSP_UTIL.

ATTENTION

1. If MAKEDELETIONS is on, then for certain inconsistencies the user will be deleted from the system. These users will then have to be keyed into the system by the administrator
2. If the Hospitality feature is installed on your system, then place the PMS link in bypass mode before running the commands with MAKEDELETIONS on. Otherwise, you might delete users being checked in or out. If any checkins or checkouts occurred, do a database swap.

FIXCABTOUSERS <volume>

This command is used to list/delete mismatches between cabinets that exist on a volume and their corresponding entries in the Organization Directory. If the MAKEDELETIONS flag is set to “Yes,” run this command before FIXUSERSTOCAB.

Each user cabinet that exists in /<volume>/users is opened in turn. The user's client ID is extracted from the personal profile which resides in his cabinet and is used to look up his entry in the Organization Directory. Any errors are reported (e.g., no personal profile, no matching Organization Directory entry, etc.). If the MAKEDELETIONS flag is set to "Yes," cabinets with serious errors are deleted.

FIXCABTOUSERS reports and attempts to correct (if MAKEDELETIONS is on) three types of inconsistencies. First, if the cabinet FID in the user's Organization Directory entry differs from that of the actual cabinet, the directory entry's FID will be updated to match the cabinet. Second, if the class of service in the user's profile differs from that in the directory entry, the profile's class of service will be updated to match the directory. Finally, if the name of the user's cabinet differs from the userID in the Organization Directory, then the cabinet name will be updated to match the organization directory.

FIXUSERSTOCAB <volume>

This command is used to list/delete mismatches between users that exist on a volume according to the organization directory, but whose cabinets do not actually exist on the volume. If the MAKEDELETIONS flag is set to "Yes," run this command after FIXCABTOUSERS.

Each user that exists on the volume is retrieved from the Organization Directory. The user's cabinet is checked for existence by its userID. The cabinet File Identifier (FID) is checked against the Organization Directory FID. The user's cabinet is then opened to ensure that the cabinet file exists. Each user's cabinet that does not exist (a NOTFOUND error is encountered) is listed. If the MAKEDELETIONS flag is set to "Yes," the user's Organization Directory entry is deleted.

Note: If the error code received is something other than NOTFOUND, the Organization Directory entry is not deleted.

MAKEDELETIONS <YES/NO>

This command affects the operation of FIXCABTOUSERS and FIXUSERSTOCAB. MAKEDELETIONS without arguments prompts for the value of the MAKEDELETIONS flag. If the flag is set to "No," then FIXUSERSTOCAB and FIXCABTOUSERS will display inconsistencies but not make any changes. If the flag is set to "Yes," then changes will be made to either the Organization Directory or the user cabinets as described

in this chapter. A single argument to MAKEDELETIONS will set the flag to either “Yes” or “No.”

COUNTDR

This command is used to detect possible inconsistencies in the Organizational Directory. This command is a diagnostic command only and does not perform any modifications to these directories.

COUNTDR scans through the selected index files and compares the number of users in the Organizational Directory with the number of user cabinets on the volumes. Any mismatch is reported through a Class 19 SEER which lists the number of expected users and number of users found in the Organizational Directory.

If the discrepancy is greater than ten percent of the total number of users, use the Dump-Reload utility in the Corporate Directory Tool (md_dr) utility to correct the problem.

21-4 Database Synch Utility (is_patch)

Chapter 22: Voice Services Utility (vsp_util)

All voice service definition files (Voice Menus, Announcements, Time-of-day, and Thru-Dial) are stored in the “voiceservice” cabinet. The number of files in the cabinet depends on the needs of the site.

Due to the underlying structure and architecture supporting voice service definition files (the files exist as objects under a voice service cabinet and as entries in the corporate directory) there exists the potential for file object/DR entry mismatches. Vsp_util provides three commands to resolve such mismatches:

- PATCHDR
- SYNCCABINET
- TSUPDATE

PATCHDR

PATCHDR runs through the voice service cabinet and for every file in the cabinet, it updates the associated DR entry so that the DR entry points correctly to the file ID (FID) of the file.

PATCHDR is useful when voice service cabinets are inadvertently backed up and restored on a different volume while the DR still contains references to the original files by their file names.

SYNCCABINET

SYNCCABINET runs through the voice service cabinet and the corporate directory and attempts to match up file objects and directory entries. Files without entries are moved to the field support cabinet for further investigation. *They are not deleted.* DR entries without associated files(i.e., no FIDs) are deleted. SEERs are generated for any mismatches. (If there are too many mismatches there may be an overflow of SEERs with the potential for lost SEER messages.)



CAUTION

Risk of data loss

PATCHDR matches up entries with files. If it is not run first, SYNCCABINET will delete the entries since they have out-of-date FIDs. SYNCCABINET is a potentially destructive command.

Run PATCHDR before running SYNCCABINET.

TSUPDATE

This command updates every customer's voice service profile timestamp. This is sometimes (although seldom) necessary in the unlikely event that the voice service profile timestamp is incorrect. The timestamp reflects the last time the profile was touched. An accurate timestamp is necessary for time-of-day controllers to determine if changes have been made to the profiles since the last time a time-of-day controller service switch was made. If the timestamp is incorrect or invalid, time-of-day controllers may execute a service at the wrong time of day.

Chapter 23: Disk Shadowing Maintenance (Disk Sync)

Disk shadowing is a mass storage technique in which the same data is duplicated onto a pair of disks in real time. It is used to

- reduce the chance of data loss and downtime due to disk failure
- double disk read throughput

This feature can be installed on the following system types:

- MSM (standard)
- Modular GP (optional)
- Modular Option (optional)
- EC (optional)

It is not available on other systems.

Note: The disk configurations and commands for an MSM system are the same as those described for an SPM system.

Disk shadowing on an MSM system

This section discusses disk configurations and the various commands associated with disk shadowing on an SPM or MSM system.

Disk configurations

All MSMs come with disk shadowing. The configuration on nodes 1 and 2 is shown in Figure 23-1. The configuration on nodes 3 to 10 is shown in Figure 23-2.

23-2 Disk Shadowing Maintenance (Disk Sync)

Figure 23-1
MSM configuration on nodes 1 and 2

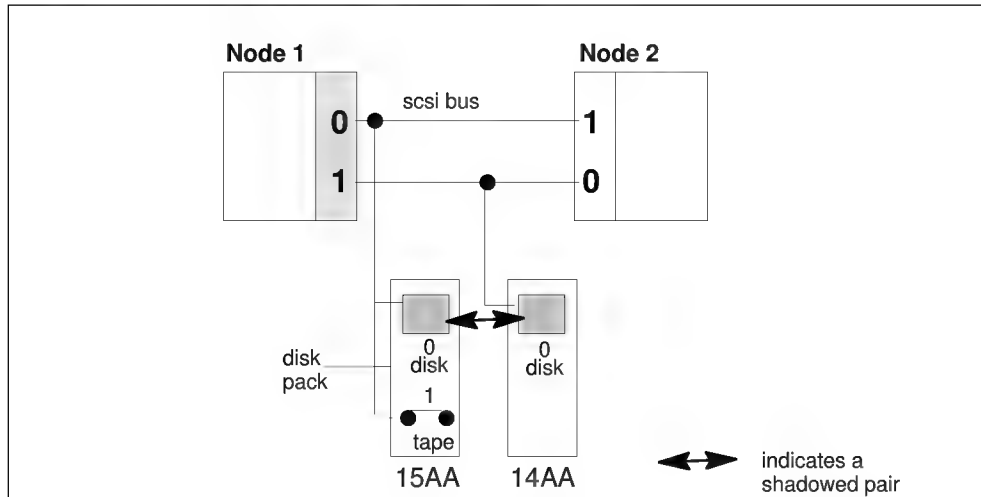
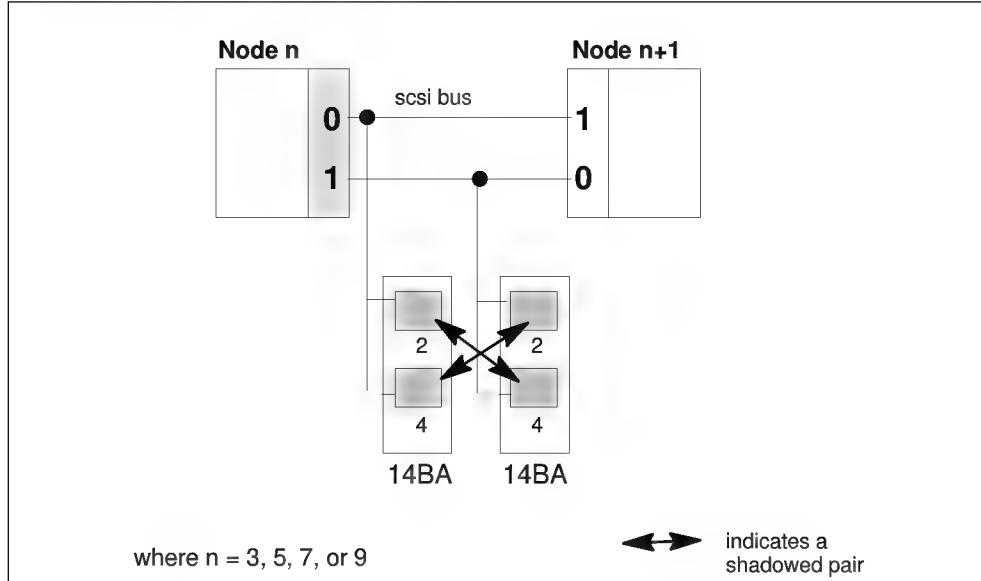


Figure 23-2
MSM configuration on nodes 3 to 10



Note the following:

- Each disk pack contributes a disk to each shadowed pair.
- Each node can access its partner's disk drives as a result of SCSI bus coupling, where node "n+1" and node "n" are partners.

The last point gives rise to the following bus and SCSI device numbering scheme:

- Bus 0 on a node is bus 1 on its partner.
- SCSI IDs normally run from 0 to 7. The device number of a device on bus 0 is simply its SCSI ID. The device number of a device on bus 1 is its SCSI ID plus 8.

Commands

All of the following commands print out a return code. 0 indicates normal completion; anything else indicates an error.

enable *src mem*

A shadowed pair is brought online by synchronizing the contents of the two disks that comprise it. This operation is referred to as "syncing" and is started by the enable command.

src specifies the location of the disk pack containing current data. Since there is only one disk pack on a SCSI bus, *src* refers to a bus, and can be either 0 or 1.

The enable command automatically distinguishes between the single-disk AA or AB packs and the dual-disk BA or BB packs. In particular, the enable command will sync both shadowed pairs related to a BA or BB pack.

mem gives the maximum amount of memory that enable is allowed to use. The default value of 64 Kbytes is recommended.

Note: The enable command automatically determines if the target disk is large enough for the file system on the source disk. If not, the command is aborted and an error message is displayed.



CAUTION

Risk of data loss

1. Syncing from the wrong source will result in lost data. Also, syncing is usually done from disk packs with enabled disks unless you are trying to clear SEER 6608.
2. Do not set the maximum memory to a value greater than 64 Kbyte on a live system.
3. Do not sync from both members of a node pair at the same time.

enable -1 *ss dd mem*

This form of the enable command syncs a given disk pair and is invoked by specifying -1 for *src*. *ss* is the device number of the disk to sync from, *dd* is the device number of the disk to sync to, and *mem* is the maximum amount of memory allowed.

disable *id*

A disk in a shadowed pair can be taken offline either by the system (automatically, in the event of a failure) or by the disable command (manually). The first method sets off a major alarm, the second does not.

fenable

This is a form of the enable command (force enable) that does not check if the target disk is large enough for the file system on the source disk.

ffsize *id*

This command displays the number of the 512-byte blocks in the file system on the device '*id*.'

find *id*

id is the number of the device to be checked. If this device is a disk, it will be spun up and its size (in 512-byte blocks) will be printed. This command may be used to verify that a node is able to communicate with all of its disks.

info *node*

This command displays a summary of a node's view of its disks. This information can be used to check if the node's disks are in sync (both disks

enabled), if a node's view of its disks is consistent with its partner's view, and how the disk space is partitioned into regions. (The "About disks" section in the "scsi_util" chapter discusses in more detail how disk space is partitioned into regions.)

For example, on node 3 of an MSM, one might get the following output:

```
node 3

disk pair 0
boot region:      32-2031
file region:2032-2936592
disk 2: RW
disk 12: RW

disk pair 1
boot region:      32-2031
file region:2032-2936592
disk 10: —
disk 4: RW
```

Both disks in a disk pair are enabled and in sync when the "disk *n*:" fields both show "RW". "RW" indicates that the disk has both Read and Write capability enabled. "R—" indicates Read only, while "—W" indicates Write only. "—" indicates that neither Read nor Write capability has been enabled. The value in the "disk *n*:" fields is also referred to as the disk's state.

Also, a node can access the same disks as its partner, where node "n+1" and node "n" are partners. Following our example, node 4 accesses the same disks as node 3:

```
node 4

disk pair 0
boot region:      32-2031
file region:2032-2936592
disk 2: —
disk 12: RW

disk pair 1
boot region:      32-2031
file region:2032-2936592
disk 10: RW
disk 4: RW
```

23-6 Disk Shadowing Maintenance (Disk Sync)

Notice from the disk states that disk pair 0 on a node is disk pair 1 on its partner. In the example above, disk pair 0 on node 3 (disk 2 and disk 12 from the node 3 perspective) is the same as disk pair 1 on node 4 (disk 10 and disk 4 from the node 4 perspective).

init

This command should be used to put the system back into a normal state if a sync operation is interrupted.

node

This command displays the ordinal number of the node that this utility is running on.

sderror num

This command displays a string description of the given error code.

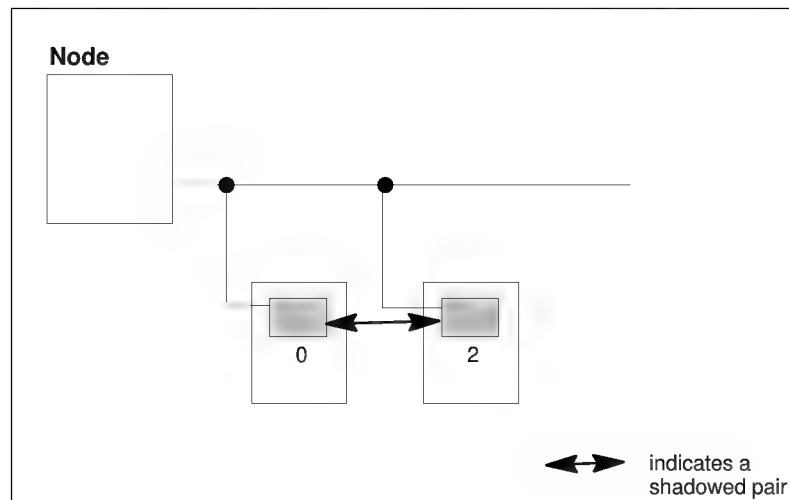
Disk shadowing on Modular GP, Modular Option, and EC systems

This section discusses disk configurations and the various commands associated with disk shadowing on Modular GP, Modular Option, and EC systems.

Disk configurations

If disk shadowing is present, the disk configuration is as shown in Figure 23-3.

Figure 23-3
Disk configuration for Modular GP, Modular Option, and EC



Commands

All of the following commands print out a return code. 0 indicates normal completion; anything else indicates an error.

enable *src dst mem*

A shadowed pair is brought online by synchronizing the contents of the two disks that comprise it. This operation is referred to as "syncing" and is started by the enable command.

src specifies the SCSI ID of the disk containing current data. When installing disk shadowing for the first time, this would be the drive that was there. When replacing a failed drive, this would be the surviving drive.

For Meridian Mail Modular GP, Modular Option and EC systems, disks are individually replaced. As a result, *src* refers to a disk and can be either 0 or 2.



CAUTION

Risk of data loss

Syncing from the wrong source will result in lost data.

dst specifies the SCSI ID of the drive to be brought online.

mem gives the maximum amount of memory that enable is allowed to use. The default value of 64k is recommended.



CAUTION

Risk of data loss

Do not set the maximum memory to a value greater than 64 kilobyte on a live system.

Note: The enable command automatically determines if the target disk is large enough for the file system on the source disk. If not, the command is aborted and an error message is displayed.

disable id

A disk in a shadowed pair can be taken offline either by the system (automatically, in the event of a failure) or by the disable command (manually). The first method sets off a major alarm, the second does not.

fenable

This is a form of the enable command (force enable) that does not check if the target disk is large enough for the file system on the source disk.

ffsize id

This command displays the number of the 512-byte blocks in the file system on the device 'id.'

find id

id is the number of the device you want to check. If this device is a disk, it will be spun up and its size (in 512-byte blocks) will be printed. This command may be used to verify that a node is able to communicate with all of its disks.

info node

This command displays a summary of a node's view of its disks. This information can be used to check if the node's disks are in sync (both disks enabled), and how the disk space is partitioned into regions. The "About disks" section in the "SCSI_UTIL" chapter discusses in more detail how disk space is partitioned into regions.

Both disks are enabled and in sync when the "disk *n*:" fields both show "RW". "RW" indicates that the disk has both Read and Write capability enabled. "R-" indicates Read only, while "-W" indicates Write only. "-" indicates that neither Read nor Write capability has been enabled. The value in the "disk *n*:" fields is also referred to as the disk's state.

For example, on node 1 of an EC system, one might get this output:

```
node 1

disk pair 0
boot region:      32-2031
file region:2032-665153
disk 0: RW
disk 2: RW
```

Disk 0 and disk 2 both have Read and Write ("RW") capability enabled, so they are both enabled and in sync.

init

This command should be used to put the system back into a normal state if a sync operation is interrupted.

node

This command displays the ordinal number of the node that this utility is running on.

23-10 Disk Shadowing Maintenance (Disk Sync)

sderror num

This command displays a string description of the given error code.

Chapter 24: Outcalling Server Utility (ocs_util)

This utility gives you a real-time view of the Outcalling Server's actions. This information is displayed on an Outcalling Server status screen.

Accessing the Outcalling Server status screen

To access the Outcalling Server status screen, follow these steps:

- 1 Select the menu item "other" at the main ETAS Tools menu to view the second menu of ETAS tools.
- 2 Select "ocs_util" from the second menu. The menu refreshes (the menu reappears after a few moments with your entry blanked out).
- 3 After the menu refreshes, press <Ctrl>-<W> and a new window appears containing several fields including one labeled "OCS_UTIL".
- 4 Move the cursor (use the arrow keys) to the ocs_util field and press return. An angle bracket prompt (">") appears.
- 5 Enter **ocsdebug** at the prompt and press return. The Outcalling Server status screen appears.

Outcalling Server status screen

This is a read-only screen. The only possible action is to leave the screen with the [Exit] softkey (Chapter 1 outlines how to return to the ETAS menu after you exit this screen). While displaying this screen the Outcalling Server (OCS) will be slowed down because of the added overhead of communicating it's actions to this screen.

The Outcalling Server status screen has three different sections: Sessions and channels, Queues, and Actions for the future. An example is shown in Figure 24-1.

Figure 24-1
Outcalling Server status screen

OutCalling Server						
Sessions	Voice	MultiM	Voice Queues	Items	Delivery	Time
Processing	0	0	Send Queue	0	**/**/**	**,**,**
Revalidate	0	0	Deferred List	1	28/09/93	16:15:00
Pull Plug	0	0	MultiMedia Queues			
Available	9	1	Send Queue	0	**/**/**	**,**,**
Unavailable	3	5	Deferred List	0	**/**/**	**,**,**
Action within the next 5 minutes						
None.				in (C.Sec) 30000		
Future Actions						
Commit Audit File		28/09/93	16:21:11			
Pull Plug	Voice	**/**/**	**,**,**	MultiM	**/**/**	**,**,**
UnBlock	Voice	**/**/**	**,**,**	MultiM	**/**/**	**,**,**
Recover Requests	**/**/**	**,**,**	Recovery Inactive			
Present Time		28/09/93	16:08:46			
Exit						

Sessions and channels

The Outcalling Server has a pool of data structures called sessions. When a request (RN, DNU, or FP) needs to be delivered, it is assigned to a session. An attempt is then made to find a channel for the session. RN and DNU require a voice channel. FP requests require multimedia channels.

The screen display lists a number of counters (# of Channels) beside each of the different possible states of a session.

Processing

This is the number of sessions which currently have a channel assigned and are actively trying to deliver a request.

Revalidate

This counter refers to those sessions which had a channel but were unable to complete the delivery. These sessions are waiting for the next available channel. For example, a channel should have been available, the request was assigned to a session, but when it came to acquiring a channel, all the channels were in use. There are also a number of error recovery situations where this situation may arise.

Pull plug

This counter refers to the number of sessions that are on a timer for critical software points during which an RN or DNU session switches to another voice service. When an RN or DNU request is made, an outcalling agent places the call. If the response is non-busy or answered, this agent switches to another kind of voice service, such as Voice Messaging, and proceeds with the request. When this switch is made, the outcalling agent dies as part of the process. The OCS waits a short period of time (a timeout value) during which the new service indicates that it is in operation. If the switch to a new service is not successful (that is, the OCS doesn't receive a signal from the new service), then the OCS resets the session state to "revalidate" (to try again).

Available/Unavailable

The total number of sessions which can be made on any system is the total number of 32-kbyte channels. The administrator can limit the number being used for voice outcalling from the Outcalling Administration screen. For fax outcalling, the limit can be set in the Fax Administration screen. The number available matches the numbers set in this screen. The number unavailable represents the remaining balance with the total number of 32k channels.

Note: The number of 32-kbyte voice channels is represented here by the number of channels given as the first parameter after the "V" to the Outcalling Server from the startlist, not the true number of 32-kbyte channels. Normally these will match.

The number of 32-kbyte multimedia channels is represented here by the number of channels given as the first parameter after the "M" to the Outcalling Server from the startlist, not the true number of 32-kbyte channels. Normally these will match.

Queues

There are really two queues within the OCS, called the Send Queues. These queues contain all the requests that are waiting for a session/channel.

The Deferred Lists are not queues. They list those requests that are to be handled in the future. These are sorted according to the time at which they should occur.

The screen display lists the number of items in each structure and the delivery time for the first element in each.

Actions

One of the following actions may be performed:

- Move items from the deferred list to the send queue.
- Pull the plug on a session.
- Commit the Audit Trail (committed every few minutes).
- Release the server from being blocked from acquiring a channel.

The server may become blocked when the OCS has tried to acquire a channel but was unable to because of a lack of available channels or because of an error situation. The OCS will wait a short period of time and try again. (The wait time is configurable from either the Outcalling record or the Fax record using ad_util.)

The *Action within the next 5 minutes* field gives a textual explanation of what the next action will be. The specified time (in centi-seconds) is the amount of time left before the action will occur.

At the bottom of the screen there are time stamps indicating actions for the future. They include

- Commit audit file
- Pull plug (voice)
- Pull plug (multimedia)
- Unblock (voice)
- Unblock (multimedia)
- Recov (followed by a recovery information field)

The present time value is the time at which the OCS last updated the screen.

Chapter 25: Network Debugger (nethost)

Introduction

The objective of the Network Debugger program is to provide the users with a single-point debugging facility that enables them to remotely access any processor debugger. All input/output information of a processor debugger will be directed to/from the Network Debugger terminal screen.

The intent of this document is to present a detailed description of the following:

- Starting the Network Debugger
- Network Debugger functions
- User Interface to the High-Level debugger
- Network Debugger command summary
- Summary of the error messages

Note: The nethost utility is not available on single-node systems.

Starting the Network Debugger

The Network Debugger is released with the Debugger. The Network Debugger is a regular user program and may be started either by executing the PD file (NetHost) or by forking it on your CLI shell. For Meridian Mail the PD file NetHost is located under the “:BOOT100:PD” directory.

The processor chosen to run the Network Debugger must satisfy the following requirements:

- The processor has an attached terminal or window which is not used for any other input/output during the Network Debugger operation.
- The processor terminal supports ADM31, VT220 or NT220 mode. This mode is provided by all TS1 terminals and some of the FALCO Fame II terminals and the VT220 or NT220 terminals.
- The port must be defined in the hardware database as a terminal port.

Network Debugger functions

The Network Debugger enables the user to conduct multiple debugging sessions simultaneously from the Network Debugger screen. It provides the user with a single-node debugging environment by redirecting the node High-Level Debugger command input/output to the Network Debugger console screen.

Throughout this chapter, the node where the user intends to start a debugging session is referred to as a *target node* and the target node High-Level Debugger is referred to as a *target debugger*. The set of nodes that are debugged from the Network Debugger at the same time is referred to as a *host debugger subnet*.

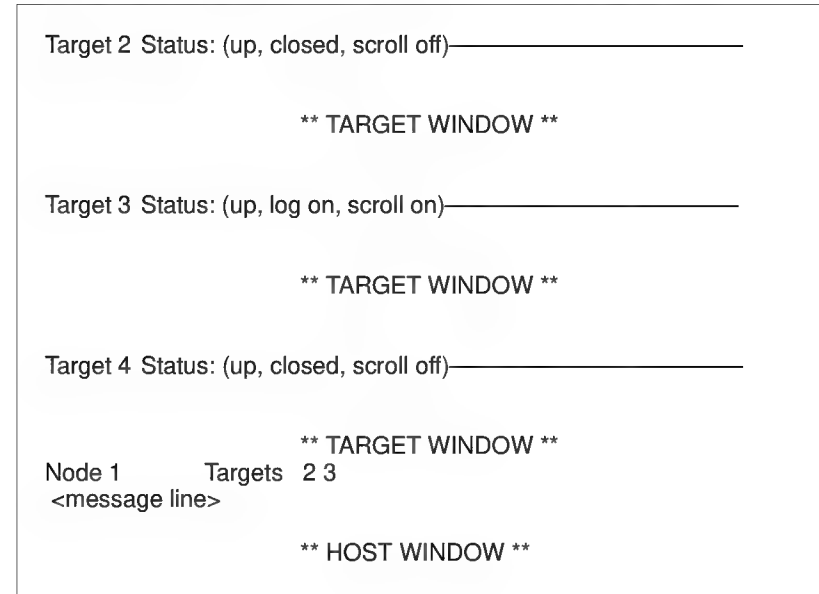
This version of the Network Debugger provides the user with the following facilities:

- console screen management
- flexible target node address format
- connection/Disconnection of a target node to/from a host debugger subnet
- logging of a target debugger input/output commands in a target log file

Console screen management

The physical screen of the Network Debugger is divided in two parts: the target portion and the host portion (see Figure 25-NO TAG).

Figure 25-1
The Network Debugger screen



Host window

The Host portion of the screen is allocated for the Host window. The Host window is used for accepting the Network Debugger commands and for displaying error and notification messages. The size of the Host window is fixed at five lines. This window appears at the bottom of the screen. The host window occupies all five lines of the host portion of the physical screen. The first line is designated as the host window banner line, the second line is designated as the message line, the rest is used for the Network Debugger command input/output. The host banner line provides the user with the list of the target virtual node number of the nodes that are currently in the host subnet and the host's virtual node number. When all host target node numbers cannot be explicitly displayed on the host banner, only the first 11 numbers are shown on the host window banner followed by the characters "& ...". The command TARGETS displays a list of all host targets.

The node number is displayed as a decimal virtual node number. The host banner line is updated each time a target node is connected/disconnected from the host subnet. The key character "~" is defined as the prompt for the host window.

The host window is created during Network Debugger initialization. The host window prompt will be positioned at the first line of the host window to indicate the start of the debugging session.

Target window

During the connection of a target node to the host debugger subnet each target node is allocated a window. A target window is used for accepting a target debugger and displaying its output. The size and location of the target window(s) is variable and depends on the number of target windows currently displayed.

The target portion of the screen can accommodate only a small number of reasonably sized windows, which limits the number of target windows that are visible on the screen at the same time. The minimum size of a target window is 4 lines; the maximum size of a target window is 16 lines. A maximum of four target windows can be displayed at any given time. Each window is separated by a line of dashes. The target window banner starts with the word "Target" on the window banner.

The contents of a target window are not buffered at any given time. Therefore, the user cannot redisplay the previous window content. If the screen contents are corrupted because of noise or extraneous output, the user may restore the original window banner lines for the current set of visible target windows and the host window banner line by executing the command REFRESH.

The user can decide which windows to display on the host screen by means of the SEE command. Two options are provided to the user:

- Display the new set of windows, erasing all previous windows.
- Add/erase the set of windows.

Both operations refresh the target portion of the screen, indicating each target window by its window banner and positioning the cursor at the first line of each window.

The following information is displayed on the target window banner line:

- Virtual Node Number
- Node State

The mnemonics are as follows:

up—state up; down—state down; hard up—state hard up; boot—state booting.

- Log File Status. The log file has one of the following states: never opened, logging on, logging off, closed. The mnemonics are as follows:

log on—logging on; log off—logging off; closed—closed; not open—never opened.

- Scroll option setting on/off. The mnemonics are as follows: scroll on—scrolling on; scroll off—scrolling off.

25-6 Network Debugger (nethost)

The prompts which may appear in the target window are:

- Virtual Node Number>>, for example 2>> — target debugger command prompt
- Virtual Node Number>>>>, for example 2>>>> — target debugger subcommand prompt
- Virtual Node Number*>, for example 2*> — line trace prompt
- Virtual Node Number?, for example 2*> — ^B interrupt prompt

Switching windows

At any given time, one of the windows is the current window. Only the current window receives input from the keyboard. Neither the host window nor the target window has a type-ahead feature.

The current window (where the user input is received) is indicated by the presence of a prompt in this window

To conduct a target debugging session the user must switch between windows to send input commands to a target debugger. Window switching is achieved by using a [Next Window] key. The <Tab> key is used as a [Next Window] key. The <Tab> key moves the cursor in one direction only, from the host window to the target window at the top of the screen and then down the screen to the next target window until the cursor reaches the host window again.

Scrolling

The scrolling option controls the window page size. If the window scrolling option is Off, the user will be prompted each time the window is filled. The “Pause” prompt will appear at the end of the window banner line. To continue output the user may type any character except for “!” and “n”/“N” as a response, but the <CR> is preferred. To stop output the user must enter N or n after the “Pause” prompt.

When the scrolling option is on, information will be displayed in the window as soon as it is received. The window is cleared after reaching the last line and the output resumes on the first line.

For each target window scrolling is off by default. Scrolling is permanently set to off for the host window.

The scrolling option of a target window can be changed with the help of the SCROLL command. To reset the scrolling option for all target windows the user must execute the command SCROLL ALL ON/OFF. To display the scrolling option setting for all windows, the commands SCROLL or SCROLL ALL should be used. The output will be displayed in the host window in the following format:

```
Node # 2 -> Scroll OFF
Node # 3 -> Scroll ON
```

To change the scrolling option of a specified target the user must execute the command **SCROLL node# ON/OFF** where node# is a target address.

25-8 Network Debugger (nethost)

To display the scrolling option of a specified target node the command `SCROLL node#` should be used.

You do not have to wait until all window output has been displayed to execute the `SCROLL` command. For instance, after a few full pages of constantly displayed window output, you may turn scrolling off. The window output will be stopped after the next full window and the prompt "Pause" will be displayed. Typing `n` or `N` as a response to this prompt will interrupt the target debugger output.

Target node address format

The target node address is used as an argument to all Network Debugger commands. A target address may be specified in decimal or hexadecimal format. The “#” character must be added in front of the target node number to represent a hexadecimal value.

Connection/Disconnection of a target node

There is a limit on the number of target nodes which can be simultaneously connected to the Network Debugger. This limit is set during the Network Debugger engineering process. The limit is five for the first release. The user is provided with capability of changing the set of target nodes which are in the host subnet.

Before initiating a target node debugging session, this target node must be made known to the Network Debugger (i.e., this target node must be added to the host subnet).

The **ADD node#** command is used to incorporate the target node into the host subnet. The success of the operation is communicated to the user by the display of the message “Node # has registered” on the host window message line and by the appearance of this target node number at the host window banner line.

The failure to add a new target node is indicated by the message “Node # is not added” followed by a statement of the reason for the failure. ADD may fail for one of the following reasons:

- The node is already in another host subnet
- There is failure to communicate with the target debugger due to network problems
- The target is down or the Network Debugger is experiencing resource problems.

After the completion of the target node debugging session the user should remove the target node from the host subnet to free the Network Debugger resources. The **QUIT node#** command will disconnect the specified node from the host. The message “Node # disconnected” is displayed if the operation was successful. If the target window was present on the host screen at the disconnect time, it will be removed upon successful disconnection and the screen will be refreshed, leaving the rest of the target windows visible.

25-10 Network Debugger (nethost)

The failure to disconnect a target node is indicated by the message “Node # is not disconnected” followed by an explanation of the reason for the failure. The reasons for failure are

- The node is already in another host subnet.
- There has been a failure to communicate with the target debugger due to network problems.
- The target is down or the Network Debugger is experiencing resource problems.

When the user attempts to connect or disconnect a target node that is not responding, it takes approximately 24 seconds to get the response after typing a command. The message “Please wait” will be displayed on the host message line each time the command **ADD** or **QUIT** is issued.

Logging of a target debugger input/output

Target debugger input and output may be captured in a log file. First the user must explicitly open a log file, since the default condition after the addition of a target node to the host subnet is “log file not open.” The log files are created on accessible file servers or the LOCAL file server. During Network Debugger initialization time, the Network Debugger version number is displayed and the user is prompted for the name of the default directory. If the directory is not specified, the preset default directory (“NETDEBUG”) is chosen.

Opening log file

The command **OPEN node# filename** is used to open a log file. The user is provided with three options where he can create a log file:

- If a file name argument starts with a colon (:) then the file name argument is treated as an absolute file pathname.
- If a file name argument does not start with a colon (:), then the file name argument is added to the established default directory.
- If a file name argument is absent then use a log file with the default name LOG(name address). TEXT is opened in the existing default directory.

When a log file with the specified name already exists then this file is opened for append.

The commands **OPEN** or **OPEN ALL** will open the log files with the default log file names in the default directory. The log files will be opened for all target nodes in the host subnet for which the log files currently are not opened.

The log file status is indicated on a target window banner. Successful opening of a log file will change the status from <no> which means that a log file does not exist, to <w> which means that a log file is open and the logging option is on.

The failure to open a log file results in the message “ERROR[Gwmngr] – Fail to open file node # => IORESULT” in the host window message line.

Closing log file

The command **CLOSE node# filename** is used to close a target node log file for a specified target node. The filename argument is optional.

The commands **CLOSE** or **CLOSE ALL** will close all log files which are currently open.

Successful closing of a log file will change a window log status to “c”, indicating that the log file is closed.

The failure to close a log file results in the message “ERROR[Gwmngr] – Unable to close file node # => IORESULT” in the host window message line.

Changing logging option

The **LOG** command allows the user to disable or enable the logging of debugging information without affecting the open/closed status of the log file. The command **LOG node# ON/OFF** is used to control the flow of logging data.

The command **LOG ALL ON/OFF** will turn the logging option ON/OFF for all the target nodes in the host subnet for which the logging option was different than the one specified in the command.

The command **LOG** or **LOG ALL** will display the logging option setting for all target nodes in the host subnet in the host window in the following format:

```
Node # 2 -> Log ON
Node # 3 -> Log OFF
Node # 2 -> File not open
Node # 3 -> File closed
```

The command **LOG node#** will display the logging option setting only for the specified node.

User Interface to High-Level Debugger

The user communicates with a target debugger through a target window. To start a target debugger session it is necessary to select the appropriate window. When a target debugger is not talking to the host the prompt “?” will appear. To establish communication between the host and a target debugger the user must issue the equivalent of a ^B interrupt by typing **!<cr>** after the “?” prompt. As a result of the successful execution of the interrupt the normal debugger prompt “>” will appear, preceded by the word “BREAK.”

When a target node crashes or experiences problems communicating with the host, the following messages are displayed in a target window if it is current or visible at the time the message arrives:

- “ERROR[Scrnmgr] — Fail send ^B to node #” — The user previously sent an interrupt to a target debugger.
- “ERROR[Scrnmgr] — Fail talk to node #” — A target debugger was waiting for the user commands or it was sending target debugger output.

The user is also notified about the communication problem between the host and target debugger if a target window was not current or visible. When such a target window becomes current, one of the following messages will appear in a target window:

- Fail send ^B
- Fail talk to node

It takes a few seconds to a minute to process the interrupt in case of a network problem. The user is then given the message “Attn sent No response” to warn the user not to send additional interrupts.

All commands of the Extended High-Level debugger are supported with a few exceptions. This is the list of commands which will not be processed from the host side:

- Maxbug debugger invocation—M
- Kernel debugger invocation—Kerndebug
- Setting screen page size—Pagesize

25-14 Network Debugger (nethost)

After starting debugger sessions with a few targets, the target debugger's output will be directed to the corresponding window regardless of which window is current at any time.

Host commands

Commands are given to the host through the Host window.

Target node debugger commands are not recognized in the host window and the host debugger commands are not recognized in target windows.

There are currently 10 Host window commands. The user may use the recognizable abbreviation when issuing a command.

ADD

ADD (node#)

This command is used to include a target node in the host subnet. The number of arguments is limited to the maximum number of nodes simultaneously connected to the Network Debugger. The command abbreviation is **A**.

QUIT

QUIT (node#)

This command is used to remove a target node from the host subnet. The number of arguments is limited to the maximum number of nodes simultaneously connected to the Network Debugger. If given without arguments then it will terminate the host debugger. The command abbreviation is **Q**.

SEE

SEE ([+|-] (node#)..) .. |

SEE (node#)

This command is used to make a target window visible (or if currently visible, hides it). The + or – function indicates the action to be taken.

The function is defined as follows:

- **+** makes the target window visible and adds it to the current set of visible windows.
- **–** makes the target window invisible and removes it from the current set of visible windows.

Each time this command is issued the target portion of the screen is erased and the screen is redrawn for the new set of the visible windows. A maximum of four windows can be visible at any given time.

When the function is not provided by the user the new set of windows for the specified processors are made visible on the host screen.

For each function the user may specify no more than four target node addresses. The command abbreviation is **SE**.

RESET

RESET (node#)

This command is used to reset the target node. The command abbreviation is **RES**.

SCROLL

SCROLL [(node# | ALL) [of | on]]

This command is used to set the scroll option for a target window. If no scroll state is specified, the current state will be displayed.

OPEN

OPEN [(node# | ALL) [filename]]

This command can be used to create an output file for a specified target node. The filename specified must be absolute or relative to the default directory pathname. If the filename is not given, then the output file with the name LOGNODE#.TEXT will be opened in the directory initially provided by the user. When a file is initially opened, logging is enabled. The command abbreviation is **O**.

LOG

LOG [(node# | ALL) | (of | on)]

This command can be used to interrupt or resume the recording of a target node debugging session. The ALL option applies to all targets that are known when the command is issued. Targets that are registered after either of these commands has been issued with the ALL option will NOT be affected. Issuing the command LOG node OFF does not close the log file. Log files must be explicitly closed by means of the CLOSE command. The command abbreviation is **L**.

CLOSE

CLOSE [(node# | ALL)]

This command will close an open file regardless of whether the logging option is off or on. Once closed, a log file can be reopened, so further writing of the contents of the associated window can take place to this file. Users must be careful to close all desired log files before disconnecting a target node or aborting the host debugger program. The command abbreviation is **C**.

HELP

The HELP command will provide information to the user for all commands available from the host window.

The Help command format is as follows:

HELP [command string]

If a command string is recognizable then this command is explained to the user. Otherwise an error message is displayed for help.

If no command string is specified, all commands are displayed.

If the user makes a syntax error while typing a command, help information will be displayed for this command.

Help information for each command is as follows:

- **ADD (node# | card #) ...**— connects a target node to a host;
- **QUIT [(node# | card#)] ...**—disconnects a target node from a host, without arguments exits a host;
- **SEE ([+|-] (node#) ..) ..** |—adds or deletes a target window to a displayed set of windows;
- **SEE (node#) ..**—displays a set of target windows;
- **RESET (node#)**—resets a target node.
- **SCROLL [(node# | ALL) [of | on]]**—sets or displays a target window scroll flag, prompt is given if flag is off.
- **OPEN [(node# | ALL) [filename]]**—opens a default or specified log file turning logging on.
- **LOG [(node# | ALL) | (of | on)]**—turns logging off or on.
- **CLOSE [(node# | ALL)]**—closes all or a specified log file.
- **REFRESH**—redraws the current host screen.
- **HELP [command]**—displays the syntax for the command(s).
- **TARGETS [(node# | ALL)]**—displays target nodes connected to a host.

The abbreviation for the HELP command is **H**.

TARGETS

TARGETS [(node# | ALL)]

The host banner line displays the target node addresses for nodes, connected to the host. The host banner line only is 80 characters long. It can only accommodate a few target node addresses. When the characters "& ..." are displayed on the host banner line, more targets are connected to the host than actually displayed.

The command **TARGETS** will display the target node address and the target status the same way as on the target banner.

Target 5 Status: (up, closed, scroll off)

The command abbreviation is **T**.

REFRESH

REFRESH

This command does not have parameters. The execution of this command will result in blanking of the host screen and redisplay of the banner lines for the current set of visible windows. The cursor will be positioned at the first line of the host window. The minimum recognizable length is three, therefore an abbreviation is **REF**.

Summary of error messages

All Network Debugger commands have the same format which includes the unit name in square brackets—[]—, followed by the reason for the error. The following error messages may occur during execution of the Network Debugger commands:

ERROR[Gwmngr]—Exceeded MAX visible windows host screen

ERROR[Gwmngr]—Wrong number of command arguments

ERROR[Gwmngr]—Argument value out of range

ERROR[Gwmngr]—Argument not numeric

ERROR[Gwmngr]—Argument not hexadecimal

ERROR[Gwmngr]—No target processors in host subnet

ERROR[Gwmngr]—Processor NOT in host subnet

ERROR[Gwmngr]—Window NOT visible on host screen

ERROR[Gwmngr]—Too many lines in Gw output

ERROR[Gwmngr]—Syntax error

ERROR[Gwmngr]—Invalid command

ERROR[Gwmngr]—Invalid node number

ERROR[Gwmngr]—Processor already in host subnet

ERROR[Gwmngr]—Unexpected error

The error messages relevant to the high-level debugger command execution are sent from the target debugger.

Chapter 26: Enable installed features (sc_featpkg)

Meridian Mail 12 supports online enabling of features on the Message Services Module (MSM). The features that can be enabled online are

- MultiCustomer
- Dual Language Prompting
- Voice Menus
- Multi SMDI
- Voice Messaging
- AMIS
- VoiceForms

ATTENTION

This utility applies only to Meridian Mail systems running on an MSM.

You enable these features using keycodes. Note that the normal keycode rules concerning decreasing hardware and features apply.

When new features that *cannot* be enabled online are included in a keycode, the operation continues but the user is advised that the particular feature could not be enabled. Similarly, if the languages or hardware which *cannot* be enabled online is included in the keycode, the operation

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continues but the user is advised that the language or hardware item could not be enabled.

Procedure 26-1 Online enabling of features

Starting point: ETAS level menu

Note: The values shown throughout this procedure are for reference purposes only. The values will vary depending on the site configuration.

- 1 Select the Enable Installed Features option from the menu.

The following messages appear:

```
Package COBRA_PKG.AREA loaded.  
Starting RW100 server  
RW100 has been started
```

The screen refreshes and the system configuration is shown as follows:

```
System Configuration  
  
                                Old System    New System  
Software Release                : 12.09.0  
Serial Number                   : siteabc  
Platform                       : MSM  
MSP Nodes                      : 2  
SPN Nodes                      : 8  
T1 Nodes                       : 4  
Storage Hours                  : 1200  
Max Languages                  : 1  
  
CHANNELS  
Max Full Service                : 192  
Min MultiMedia                 : 0  
Max Voice                      : 192  
Total Physical                 : 192  
Basic Service                  : 0  
NMS Locations                  : 0  
  
-----  
  
Enter the keycode for the serial number siteabc  
Enter 4 Character Block 1 :
```

- 2 Enter the first block of four characters.
- 3 Enter the second block of characters.

- 4 Enter the third block of characters.
- 5 Enter the fourth block of characters.
- 6 Enter the fifth block of characters.

If the keycode you have entered is invalid, the following message and prompt appear:

```
THAT KEYCODE IS NOT VALID
DO YOU WISH TO TRY AGAIN ? Yes
```

- a. If you wish to reenter the keycode, respond Yes to the prompt and go to step 2.
- b. If you do not wish to reenter the keycode, respond No to the prompt. A message will appear informing you of the following:

```
Feature Enable aborted by user.
```

```
Press RETURN to continue
```

If the keycode you have entered is valid, the screen refreshes and the following appear:

System Configuration

	Old System	New System
Software Release	: 12.09.0	12.09.1
Serial Number	: siteabc	siteabc
Platform	: MSM	MSM
MSP Nodes	: 2	2
SPN Nodes	: 8	8
T1 Nodes	: 4	4
Storage Hours	: 1200	1200
Max Languages	: 1	1

CHANNELS

Max Full Service	: 192	192
Min MultiMedia	: 0	0
Max Voice	: 192	192
Total Physical	: 192	192
Basic Service	: 0	0
NMS Locations	: 0	0

```
-----
Enter 4 Character Block 4 : 4d4d
```

```
Enter 4 Character Block 5 : 5e5e
```

```
Is this correct ? Yes
```

26-4 Enable installed features (sc_featpkg)

- 7 If any of the values for the new system is incorrect, respond No to the prompt.

The screen refreshes to the System Configuration screen which shows only the old system values.

a. Go to step 2.

- 8 If the values for the new system are all correct, respond Yes to the prompt.

The screen refreshes and appears similar to the following:

Feature	Old	New	Feature	Old	New
SMDI	: X	X	Voiceforms	:	
Meridian ACCESS	:		VMUIF	:	
AdminPlus	:		Multiple Admin	:	
AMIS	:		Meridian Connections	:	
HVS	:		Fax on Demand	:	
Networking	:		Multiple Customer	:	X
NMS	:		Bilingual Prompting	:	
Outcalling	:		Voice Menus	:	
Multi SMDI	:		Client Mailbox Admin	:	

Is this correct ? Yes					

Note: Features that will be enabled by this operation are indicated by an "x" in the New column.

Note: The information on the screen will vary for each site.

- 9 If any of the information on this screen is incorrect, respond No to the prompt.

The screen refreshes to the System Configuration screen which shows only the old system values.

a. Go to step 2.

- 10 If the information on the screen is correct, respond Yes to the prompt.

Note: If there are no new features to be online enabled, you will be notified and prompted if you would like to enter another keycode.

The screen refreshes and lists the features that will be enabled as follows:

Online Feature Enable

- Multi Customer Feature will be online enabled

Saving system record to disk

Finished updating all accessible customer profiles.

Features Enabled has successfully completed.

Press RETURN to continue

Note: Any new features that cannot be online enabled are listed and you are advised to run an offline comprehensive upgrade.

- 11 Press <Return> to continue.

The ETAS level menu appears.

26-6 Enable installed features (sc_featpkg)

Chapter 27: Change serial number (sc_serchange)

Note: This utility is available for all systems with the exception of Card Option systems.

This feature will allow sites to change their serial number to match the 11-digit serial number of their switches. This will have no impact on the day-to-day operations of the system but will mean end-users will only be required to maintain one serial number for their Nortel products.

Since serial numbers are the heart of our security, we will be using keycodes to control the change of serial numbers. A keycode designed to change serial numbers can be used to change only serial numbers—it can't be used for other system operation functions such as storage expansion.

Changing the serial number

Follow the steps outlined below to change a site's serial number.

Procedure 27-1

Changing the serial number

- 1 Select "Other" from the ETAS main menu.
- 2 Select the Change Serial Number option.

The following messages are displayed:

```
Loading Change Serial Number Utility.
```

```
Starting RW100 server.
```

```
Please enter the Change Serial Number Keycode.
```

```
Enter 4 Character Block 1
```

- 3 Enter the first block of (alphanumeric) characters.
- 4 Enter the second block of characters.

27-2 Change Serial Number (sc_serchange)

- 5 Enter the third block of characters.
- 6 Enter the fourth block of characters.
- 7 Enter the fifth block of characters.
- 8 Use this step if the keycode you have entered is invalid. If the keycode is invalid, the following message will appear:

```
THAT KEYCODE IS NOT VALID  
DO YOU WISH TO TRY AGAIN ? YES
```

- a. If you wish to reenter the keycode, respond YES to the prompt, and go to step 3.
- b. If you do not wish to reenter the keycode, respond NO to the prompt to quit the operation.

The ETAS level menu appears.

- 9 Use this step if the keycode is valid. If the keycode is valid, the following message will appear:

```
About to change serial number from : oldserial  
                                     to : newserial  
Continue ? Yes
```

- a. If you wish to continue the operation, respond Yes to the prompt.

The following message appears before you are returned to the ETAS level menu :

```
The serial number has been changed.
```

- b. If you do not wish to continue, respond No to the prompt.

The ETAS level menu appears.

Chapter 28: Online Storage Expansion (sc_flexpkg)

In Meridian Mail 12, MSM customers can increase their storage capacity from 150-hour to 300-hour, or from 200-hour to 400-hour, disk packs without system down time.

Note: This utility is only available for MSM systems.

This increase in storage is a two step operation.

- The first step is to change to the 300- or 400-hour disk packs. This step can be done by the system administrator from the MMI Disk Maintenance screen.
- The second step is to run the online storage expansion utility (sc_flexpkg) to create new volumes and update system files. This step is the ETAS-level operation.

Note: Not all 150-hour or 200-hour disk packs need to be expanded at the same time, although it is highly recommended.

Step 1: Changing the disk packs

The following is a list of actions that the system administrator must complete before the online storage expansion utility can be run. If these steps were not successfully completed, there may be problems in successfully completing the expansion operation.

Note: The following assumes that 150-hour disk packs are to be expanded. These steps are also applicable to 200-hour disk packs.

- 1 Identify all 150-hour disk pairs that need to be expanded.
- 2 Make sure that the appropriate 300-hour disk packs are on hand before the operation is to begin.
- 3 Replace the 150-hour disk packs, on the even nodes of all selected node pairs, with 300 hour disk packs.
- 4 Synchronize the disks on the even nodes from the MMI Disk Maintenance screen.

Synchronization for each 150-hour disk pair takes approximately 45 minutes to complete and all of them can be done in parallel.

- 5 When the disk pairs are fully synchronized, replace the 150-hour disk packs on the odd nodes of all selected node pairs, with 300-hour disk packs.
- 6 Synchronize the disks on the odd nodes from the MMI Disk Maintenance screen.

Synchronization for each 150-hour disk pair takes approximately 45 minutes to complete and all of them can be done in parallel.

When all selected disk pairs are fully synchronized, the system administrator can contact ETAS personnel to complete the expansion.

Step 2: Running the online storage expansion utility (sc_flexpkg)

After the system administrator completes the tasks identified in Step1, he or she will require the assistance of ETAS personnel to complete the operation. The following is the procedure for the final step in an online storage expansion.

Note: This step cannot be performed by the system administrator.

ATTENTION

Sc_flexpkg is a rerunnable utility. In other words, it can be rerun if the operation fails to complete. The log file (:BOOT100:FIELDSUPPORT:FLDSKLOG.TEXT) stores the result of the operation.

If the operation does not successfully complete, ensure that the system administrator has performed all of the tasks that he or she was responsible for completing.

Procedure 28-1 Performing an online storage expansion

Starting point: ETAS level menu

- 1 Select the Online Storage Expansion option.

When the online storage expansion utility is started, the following messages and prompt appear:

```
This Online Storage Expansion utility creates new
volumes for the new 300/400 hour disk packs that you
have just installed. Please check to make sure that the
new disks are properly installed and synchronized
before continuing.
```

```
Please consult the NTP for this utility before
continuing with this operation.
```

```
Do you wish to continue? Yes
```

They are properly installed if the disk status for both the prime and shadowed disks are read/write and their SCSI IDs are changed from 0

28-4 Online Storage Expansion (sc_flexpkg)

& 8 to 2 & 12 (odd) or 10 & 4 (even) respectively on the MMI Disk Maintenance screen.

- 2 Select Yes to continue.

You will then be prompted as follows:

Please select the node pairs to be storage expanded : Done

- 3 Select the node pairs to be expanded using the up and down arrow keys.

If you have selected node pairs that cannot be expanded, you will be notified.

- 4 When you have completed entering all of the node pairs, select Done at the prompt.

The following messages and prompt will appear:

You have selected to perform storage expansion on the following node pair(s):

3 & 4

7 & 8

All required information has been entered.

Do you wish to continue, re-enter information, or abort ?

- 5 Select Continue to continue with the operation if the selected node pairs are correct.

Note: *This step takes approximately 15 to 20 minutes to complete depending on the number of node pairs to be expanded.*

This step expands the storage capacity of the selected node pairs accordingly. The first thing the online storage expansion does is to synch the new disks, as seen in the following messages:

Syncing new disks

New disks synced successfully

Second, it registers the new disks, as seen in the following messages:

Registering new disks

New disks registered successfully

Node 3 disk size is 1382134.

Node 4 disk size is 1382134.

Node 7 disk size is 1382134.

Node 8 disk size is 1382134.

Third, it creates the required volumes, as seen in the following messages:

```
Creating required volumes
VS204V   created with 159576 blocks, blksize = 8192
VS204T   created with 47104 blocks, blksize = 1024
CACHEPT  created with 1250 blocks, blksize = 1024
CACHEPV  created with 3500 blocks, blksize = 8192
CACHEST  created with 1250 blocks, blksize = 1024
CACHESV  created with 3500 blocks, blksize = 8192
VS208V   created with 159576 blocks, blksize = 8192
VS208T   created with 47104 blocks, blksize = 1024
CACHEPT  created with 1250 blocks, blksize = 1024
CACHEPV  created with 3500 blocks, blksize = 8192
CACHEST  created with 1250 blocks, blksize = 1024
CACHESV  created with 3500 blocks, blksize = 8192
New volumes created successfully
```

Fourth, it starts the new VS and creates the cabinets, as seen in the following messages:

```
Starting new VS
New VS started successfully

Creating required cabinets
New volumes created successfully
```

Fifth, the hardware database is updated to create the records for the newly registered disks, as seen in the following messages:

```
Updating hardware database
Hardware database updated successfully
```

Sixth, the startlist is recreated to incorporate the information of the new VS, as seen in the following messages:

```
Creating startlist file
Startlist re-created successfully
```

Seventh, the VS is shut down, and the system record is updated.

```
Shutting down new VS
Shutting down VS204
Shutting down VS208

Saving system record to disk
System record updated successfully
```

28-6 Online Storage Expansion (sc_flexpkg)

Eighth, the startlist file is rechecked.

Re-checking startlist
Startlist checked successfully

The online storage expansion was completed successfully.

Press RETURN to continue:

The result of this operation is stored in
:BOOT100:FIELDSUPPORT:FLDSKLOG.TEXT

6 Press <Return>.

The ETAS level menu appears.

The log file

The process and result of the online storage expansion operation is stored to the log file fldsklog.text in the :BOOT100:FIELDSUPPORT directory.

The log file appears similar to the following when you type it out.

```
Online Storage Expansion begins: 14/02/99 23:45:59

Reading the system record

You have selected to perform storage expansion on the
following disk pair:
  3 & 4
  7 & 8

Syncing new disks
New disks synced successfully

Registering new disks
New disks registered successfully

Creating new volumes
New volumes created successfully

Starting new VS
New VS started successfully

Creating required cabinets
New volumes created successfully

Updating hardware database
Hardware database updated successfully

Creating startlist file
Startlist re-created successfully

Shutting down new VS
Shutting down VS204
Shutting down VS208

Saving system record to disk
System record updated successfully

Re-checking startlist
Startlist checked successfully
```

28-8 Online Storage Expansion (sc_flexpkg)

The online storage expansion was completed successfully.

Online Storage Expansion ends: 14/02/99 23:59:01

Helpful hints about the Online Storage Expansion utility

This section provides some helpful hints and answers about the online storage expansion utility in the form of questions and answers.

Question: What should I do if, in the first half of Step 1 (that is, while changing the disk packs), I pull the disk on the odd node instead of the disk on the even node on a selected node pair?

Answer: You should still synchronize the disks by going through the same synchronization steps. However, this time, it will synchronize from the even node's disk to the odd node's disk. The SCSI ID of the odd node's disk will be changed from 0 to 2.

The next step will be to replace the disk on the even node and synchronize from the odd node to the even node.

When the disks are synchronized, Step 2 (that is, running the utility) can be applied.



CAUTION

Risk of system failure

Do not simply reinsert the disk into the odd node and pull the even disk. This will disable ALL the disks on these two nodes.

The mailboxes residing on the volume on these two nodes will not be accessible anymore.

Question: What should I do if, in the first half of Step 1 (that is, while changing the disk packs), I pull a disk on the wrong node?

Answer: You should reinsert the disk and immediately synchronize the disk pair from the MMI Disk Maintenance screen.

Question: What should I do if the synchronization was broken because the new disk was bad?

Answer: You should run diagnostics (from the MMI Disk Maintenance screen) on the new disk, and if it passes, synchronize the disk again. If it still fails, replace the new disk and resynchronize the disks.

Question: What should I do if in the middle of the synchronization, the MSP switchover occurs or the system reboots itself?

Answer: If the synchronization was not completed, you can still synchronize the disks as before when the system recovers itself. However, you should always try to identify the problem for the switchover or reboot before continuing with the online storage expansion.

Question: What should I do if in the second half of Step 1 (that is, while changing the disk packs), I pull the 300-hour disk pack on the even node instead of the disk on the odd node on a selected node pair?

Answer: When this happens, the 150-hour disk pack on the odd node would still be the active disk. You have to reinsert the 300-hour disk pack into the even node and resynchronize the disks before you can continue with the next step.

Question: What should I do if in the first half of Step 1 (that is, while changing the disk packs), I pulled a disk on the wrong node and did not realize the mistake until after the synchronization was started?

Answer: You should wait until the synchronization is complete and then unsynchronize the new disk on the node from the MMI Disk Maintenance screen. Then reinsert the original 150-hour disk and resynchronize the disk pair.



CAUTION

Risk of disk damage

Do not interrupt the disk sync while it is in progress. It may damage the new disk.

Question: What should I do if in the middle of Step 2 (that is, while running sc_flexpkg), the MSP switchover occurs or the system reboots itself?

Answer: You should look at the log file "BOOT100:FIELDSUPPORT:FLDSKLOG.TEXT to determine if step 2 was completed successfully. If it was not, rerun sc_flexpkg. However, you should always try to identify the problem for the switchover, or reboot before running the operation.

Question: What should I do if an error occurred in the middle of step 2 (that is, while running sc_flexpkg) and the operation was aborted?

Answer: You should first determine what caused the operation to abort by looking at the generated SEERs (if any) and the log file.

Do *not* continue with the operation if the problem points to a hardware database or system record corruption. Contact the Northern Telecom (Nortel) Product Support group immediately.

If the problem is anything else other than a hardware database or system record corruption, rerun the operation. If the problem persists, contact the Nortel Product Support group

Question: When step 2 was rerun, I was prompted with the following message:

```
Volume 20x already exists but has not been added to the
system record.
```

```
Performing storage expansion on these two nodes will
DESTROY ALL DATA on this volume!
```

```
Are you sure you want to continue ?
```

What should I do?

Answer: If you are absolutely certain that the selected node pairs were not completed in the previous online storage expansion, you can respond Yes and continue with the operation.

Otherwise, respond No and only perform the operation on the other node pairs.

Chapter 29: Mini Debugger

The Mini Debugger allows the user to interrupt the program execution to check that it is executing as intended. Execution is interrupted at predefined breakpoints or when the user presses <Ctrl-B><Ctrl-T><Ctrl-B>.

At each breakpoint, the debugger determines whether a command list is associated with the breakpoint. If there is a command list, it is executed. If there is no such list or if <Ctrl-B><Ctrl-T><Ctrl-B> has been used, the debugger displays the prompt >> and waits for the user to enter commands. In either case, the commands usually display memory contents to check what is completed or change them to initiate alternative execution paths. This chapter describes the facilities provided by the Mini Debugger.

Note: If the debugger is waiting for the user to enter commands and there is no user input for five minutes, the debugger will automatically exit.

The following commands are supported by the Mini Debugger: IBP, DBP, RBP, DR, HISTORY, CBADDR, LP, DTCB, NEWPROG, all of the memory display commands, and all of the memory setting commands.

Notation

The following notation is used in command descriptions.

- Angle brackets “< >” denote an argument.
- Optional arguments are enclosed in square brackets “[]”.

Note: This notation is different from the notation used in other parts of the NTP.

- Arguments that can be repeated are enclosed in curly brackets “{ }”.
- Uppercase letters represent command keywords entered as shown.
- A number preceded by a number sign “#” is treated as a hexadecimal integer.
- Virtual addresses and task identifiers are always entered as hexadecimal numbers without a number sign.
- The following parameters have integer values (the abbreviations in angle brackets are those used in command descriptions):

program number	<progn>
local number	<locno>
line number	<lineno>
breakpoint number	<bptno>
variable offset	<varno>
number or count	<n>
relative id	<relid>

- Only eight characters are significant in any name specification, exclusive of underscores.
- The following parameters have string values (the abbreviations in angle brackets are those used in command descriptions):

program name	<progrname>
unit name	<uname>
routine name	<rname>
helix path name	<pathname>
- The following parameters have character values (the abbreviations in angle brackets are those used in command descriptions):

boolean operators	<boolop>
conditional operators	<condop>
variable types	<vartype>

- The contents of an address may be replaced on a single word basis by using the memory examination and manipulation commands. Such word modification <wdmod> consists of a boolean operator followed immediately by a word mask in decimal or hexadecimal. If the word mask is specified in hexadecimal, it must be preceded by a #.

Boolean operators consist of the following:

and	&
or	

- Certain data testing commands may include a test created from a comparison operator <testop> followed by user-specified test data called <test>. The comparison operator may be any of the following:

less than	<
greater than	>
equal	=
not equal	/

The test data <test> may be a decimal number, a hexadecimal number (preceded with a #), character data (preceded with a \$), or a string enclosed in quotes.

- Any address or variable offset specified as a parameter may be modified by the addition of a number +<n>, by the subtraction of a number -<n>, and/or by a dereference ^ causing it to point to a dynamic variable.
- If chaining back through activation records is possible, a negative integer -<backup> specifies the number of activation records to chain back through.

Breakpoints and their use

Program execution is suspended when it reaches a breakpoint specified by an IBP command.

If a breakpoint is encountered inside a REGION or inside a minitask, a warning message is produced and the breakpoint is ignored. Breakpoints are also ignored in code run in the supervisor mode (for example, interrupt handlers).

Breakpoints are only inserted in object code containing NEWLINES (that is, the file must be compiled with the \$D+ option, the default).

Object code with \$D- option contains enough information to allow breakpoints to be inserted on the entry and exit code of the routines in the unit.

Breakpoints cannot be inserted in a routine written in the assembler.

Breakpoint commands

IBP <progno | *> <uname> <rname> [<lineno>] [+Kernel]

This command inserts a breakpoint on a specified source line. The program number can be determined by means of the LISTPROG command, or an asterisk "*" representing the number of the current program. A line number is an optional parameter, the default being line number 0. If line number -1 is specified, a breakpoint is placed at the exit code of the specified routine to trap any kind of departure from the routine. If the option +K is entered, a kernel debugger breakpoint is inserted in the code. This debugs code run in the supervisor mode (that is, interrupt handler code). When the kernel debugger breakpoint is hit, the kernel debugger, and not the high-level debugger, is entered. If a kernel debugger is not present, an illegal instruction trap occurs.

Note: The debugger inserts the breakpoint in the specified routine, provided that the routine is unique within the unit. If there is name duplication, the user is notified, but no assumption is made as to the routine intended.

Breakpoints are inserted in the locale where the program is loaded. The debugger handles code sharing across locale boundaries. It is not possible to place a breakpoint at the same shared location for more than one locale, since inserting a breakpoint overwrites the line number.

If the specified line number does not exist, a breakpoint is placed on the next available line or on the exit code of the routine.

DBP

This command displays all active breakpoints. If subcommands are specified for breakpoints or trace termination points, these are displayed with the pertinent information.

RBP [<bptno>]

This command removes a breakpoint. The breakpoint is specified using a breakpoint number determined by the DBP command. If a breakpoint number is not specified, all breakpoints are removed.

Memory examination and manipulations

Many of the following commands require the variable number of a global, task, or local variable to be specified. This number can be determined from the compiler listing or the output of a listing generator. Due to a bug in the compiler, the number is currently specified on the line following the variable declaration.

A parameter variable number can be determined by adding all parameter sizes declared after the parameter of interest.

A local variable can be determined by adding the sizes of all locals that precede the local of interest (including the size of the local itself).

For the following set of commands, address calculation may be used to change any address specification. This includes variable specifications, since these refer to addresses in memory. It is possible to use a single command to subtract a number of bytes from a local register value, dereference it so that it acts as a pointer, and then subtract again from the address now indicated as follows:

```
DM 529BC-4^~#E 8
```

Another example is:

```
DMP -1 2  
=^ 10
```

which first displays a parameter at offset 2 in the calling routine, and then displays 10 bytes starting from the point indicated by the previous address dereferenced. The = (repeat) command is discussed later.

All variable displays refer to the currently specified context, the default being the task that invoked the debugger.

Memory display commands

For the memory display commands, a count “n” may be optionally supplied to indicate the display size in bytes, the default being 16. A word modifier may be used, but it applies only to the first word in the display. If a modifier is used, the display size must be specified. For all commands except the DM command, a backup value can be specified to display the parameters of the calling routine.

DM <virtual address> [@<locno>] [<n> [<wdmod>]]

This command displays the contents of a virtual address in the specified locale. If no locale is specified, the current locale is assumed. If the virtual address is not mapped into real memory, the value #OBAD is displayed as the contents of the virtual address.

DML [--<backup>] <varno> [<n> [<wdmod>]]

This command displays the contents of a local variable of a routine in the current context.

DMP [--<backup>] <varno> [<n> [<wdmod>]]

This command displays the contents of a parameter of a routine in the current context.

DMG [--<unitname>] <varno> [<n> [<wdmod>]]

This command displays the contents of a global variable for a routine in the current context. If a unit is specified, the global variable is displayed from that unit.

DMT <varno> [<n> [<wdmod>]]

This command displays the contents of a task global variable in the current context.

Commands for changing memory contents

For all the commands changing memory, a word replacement value <wdrep> or word modifier <wdmod> can be specified. The replacement value must be specified in hexadecimal and inserted on a word boundary. If a word modifier is specified, the current value in memory is modified. Several word replacement values and/or word modifiers may be used in one command.

SM <virtual address> [@locno] <wdrep> | <wdmod> [<wdrep>]
[<wdmod>]

This command changes the contents of a virtual address in the specified locale. If a locale is not specified, the current locale is assumed.

SML [–<backup>] <varno> <wdrep> | <wdmod>
[<wdrep> | <wdmod>]

This command displays the contents of a local variable of a routine in the current context.

SMP [–<backup>] <varno> <wdrep> | <wdmod>
[<wdrep> | <wdmod>]

This command displays the contents of a parameter of a routine in the current context.

SMG <varno> <wdrep> | <wdmod> [<wdrep> | <wdmod>]

This command displays the contents of a global variable for a routine in the current context. If a unit is specified, the global variable is displayed from that unit.

SMT <varno> <wdrep> | <wdmod> [<wdrep> | <wdmod>]

This command displays the contents of a task global variable in the current context.

Displaying system information

**DR [<taskid> | <relid> | <name> [@<locale>]] + [R] [IQ] [DQ] [RQ]
[EQ] [AQ] [FQ] [Q]**

This command displays the X-machine registers, task type and control block contents of the specified task. The taskid parameter is optional. It defaults to the current task ID context. Task IDs can be determined using the DTCB command. A locale does not need to be specified with a task ID since task IDs are unique across a node. If a name is specified, information is displayed for the first task in the current locale encountered with the name given. The R (register) option can be specified to get a dump of the machine registers. The queue options IQ (input queue), DQ (defer queue), RQ (rendez queue), EQ (event queue), AQ (agent queue), FQ (free queue) and Q (all queues) may be specified to get a detailed listing of the appropriate queue.

CBADDR [<taskid> | <relid> | <name> [@<locno>]]

This command provides the control block address referenced by the specified task identifier. A locale is not specified since task IDs are unique across a node. If a <taskid> is not specified, the default is the taskid of the current context.

DTCB [<locno>] [ALL]

This command displays the taskids and task types of all tasks initiated in the specified locale. The locale number is optional, the default is the locale of the current running task. In the display, an asterisk * marks the current running task. An equal sign (=) marks the current context if it differs from that of the currently running task. If the option ALL is specified, all control blocks (for example, all tasks, timers, agents and events) are displayed.

Miscellaneous commands

ECSLIST

This command displays the description and local number of each active ECS running on the node.

G

This command causes the debugger to be exited and the execution of the user task to resume.

HISTORY

This command displays the calling sequence of routine names, line numbers and units where the current context is executing. For each dynamic nesting level, the line number is shown as unknown if the routine call is performed via RUNPROG or if there is a breakpoint on that line. If the previous routine had a corrupt activation record (that is, the user stack has been overwritten), both the routine name and the line number are unknown.

KERNDEBUG

This command causes the kernel debugger to be entered, if present. The command is ignored if the kernel debugger is absent. Entering G while in the kernel debugger returns the user to the high-level debugger.

KILL < program number >

This command allows the user to deallocate all the resources of a specific locale by killing the program running in that locale. The MONITOR cannot be killed; and if the NODEOSP is killed, the node will be restarted.

LISTPROG

This command displays all the programs known to the debugger. Associated with each program is a number used as input to the insert breakpoint (IBP) command. In the display, an asterisk * marks the active program when the debugger is invoked. Overlays are marked with the word OVERLAY.

M

This command causes the ROM-based debugger DOODLEBUG to be entered. Typing G in DOODLEBUG returns you to the high-level debugger.

MEM [<locno>]

This command provides a system memory summary consisting of the following information:

- free memory available
- memory used (sum of segments used in system)
- total memory on this node (sum of the above two)
- largest contiguous area available
- memory reserved by monitor (code)
- memory reserved by monitor (data) per locale

The system memory summary is followed by a memory summary for each locale. However, if a locale number is specified with the command (for example, MEM 4), only the memory summary for that locale is produced. Each locale memory summary consists of the following information:

- shareable memory
- private memory
- actual memory shared (shareable memory that has been used in more than one locale)
- total number of free segment registers
- total number of segment registers reserved by the system

NEWPROG [ON|OFF]

By default, users are not notified of program starts seen by the debugger. This command allows users to specify a program whose start they wish to see, or to turn program start notification on for all programs. If a parameter is not given with the command, the current program start specification is displayed. The parameter ON causes notification of all program starts to be provided; OFF prevents notification of any program starts.

PAGESIZE <n>

This command alters the line number displayed on the screen before paging, for commands that require multiple-line displays.

QUIT

This command removes all breakpoints and causes execution to resume. The debugger task dies.

TIMEOUT [ON|OFF]

This command allows the user to specify whether the debugger will wait indefinitely for user input, or automatically continue if there is no input after five minutes. If TIMEOUT is set to OFF, the debugger will wait indefinitely. If TIMEOUT is set to ON, the debugger will continue if there is no user input after five minutes. If the parameter is not specified, the current status of the TIMEOUT command is displayed. The default is ON.

TRACEBUF

This command displays the memory address of the start of the program crash traceback buffer for the node. Note that it is only on MMP40 systems that this buffer can be saved when a node reboots.

Debugger continuous mode

HALT [ON|OFF]

When an execution error occurs, this command allows the user to specify whether the debugger should prompt the user for a command. If HALT is set to OFF, normal execution of the program resumes after the debugger traceback is produced. If HALT is set to ON, the debugger prompts for a command after the traceback. If a parameter is not specified, the current status of the HALT command is displayed. The default is OFF.

PAGE [ON|OFF]

This command allows the user to specify if the debugger should page its output displayed on the screen. If PAGE is set to ON, the debugger stops after it has filled the screen with output, and waits for user direction to continue or abort the output. If PAGE is set to OFF, the debugger will continue to display its output until completion and then will prompt for a new command. If a parameter is not specified, the current status of the PAGE command is displayed. The default is OFF.

Exception handling

The debugger handles exceptions of two types:

- An intentional exception generated by the input of a <CTRL-B><CTRL-T><CTRL-B>. This permits the user to interrupt a program, use debugging commands, and have the program resume execution.
- An exception that occurs in a user task during execution and is not handled by a user-specified EXCEPTION entry. When such an error occurs, it is described, and a procedure call history is displayed.

Information summary

The following sections describe the information displayed by the commands described in the section “Memory display commands”.

Task information

task	<task>	taskid of this task
locale	<n>	locale that this task runs in
state	Running	task is currently running
	Ready	task is ready to run
	WakeupWait	task has done a DELAY or WAITTIME
	Accept Wait	task is suspended on an ACCEPT
	InvokeWait	task has invoked another task which has not accepted it yet
	DeferWait	task has been deferred by accepting task
	ReplyWait	task is in rendezvous
	DebugWait	task is suspended by the debugger
	RemoteInvokeWait	task has invoked a task on another node
	RemoteAcceptWait	task has accepted from another node
	RemoteInvokeExpired	remote invoke has timed out
	RemoteAcceptExpired	remote accept has timed out
	ProbeDefer	task is looking for other nodes on the network
	InterLocaleInvokeWait	task has invoked a task in another locale
	TimerWait	task is waiting for an interval timer to expire
	ErrorWait	task has had an error but not handled yet
	Dead	task has terminated
	EndWait	task has terminated and is waiting for children to die
acceptmask	<list of entries>	All entry names accepted by this task in a format similar to the Pascal accept statement. This field is displayed if the task is in AcceptWait state only.

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acceptor	<task>	The task accepting an invoke from this task
entry	<entryname>	Name of entry invoked. The acceptor and entry fields are displayed only if the task is in InterLocaleInvokeWait, DeferWait or ReplyWait state.
task register	<address>	pointer to the task data
task type	<taskname>	task name as defined in the BNR Pascal program by TASK <taskname>; (or PROGRAM <taskname>)
unit register	<address>	pointer to the current unit data
unit name	<unitname>	unit name as defined in the BNR Pascal program by UNIT <unitname>; (or PROGRAM <unitname>)
local register	<address>	pointer to current procedure's parameters and local data
procedure	<procname>	procedure name
line	<n>	line number the task is currently executing
parm register	<address>	pointer to parameters to current procedure if it is an entry (since parameters are on invokers stack)
stack space available	<n>	stack space remaining in bytes
taskspace	<n>	amount of space allocated for the stack and steap of the task (through initiate call)
offspring	<n>	number of tasks initiated and events connected by this task
task result of last tasking operation	trOK trTimeout trTID	no error timeout on accept exhausted bad control block handle

	trReplyErr	receiver in rendezvous failed
	trTime	invalid wait time
	trInit	unable to initiate task
	trPool	no pools
	trMini	illegal operation in mini task
	trBuffer	no appropriate buffers available
	trStOfI	stack overflow
	trType	entry type mismatch on remote rendezvous
	trEntry	entry not found in remote rendezvous
	trNoNet	communication failure in remote rendezvous
	trLocale	invalid locale number
	trTimer	timer error
	trNoCBs	no control blocks
priority	<n>	priority goes from 0 (lowest) to 7 (highest)
parent	<task>	taskid of this task's parent (that is, who initiated this task)
buffer pool	<address>	control block identifier of the buffer pools
input queue	<task> [+]	first task on the task queue invoking entries in this task but have not been accepted yet, followed by a + sign when other tasks are on the queue
defer queue	<task> [+]	first task on the queue of tasks that have been accepted and later deferred by this task, followed by a + sign when other tasks are on the queue
rendez queue	<task> [+]	first task on the queue of tasks currently in rendezvous with this task, followed by a + sign when other tasks are on the queue

event queue	<task> [+]	first task on the queue of tasks also on the same queues as this task, followed by a + sign when other tasks are on the queue
-------------	------------	---

Register option

Specifying R on the command line causes the debugger to output a dump of all machine registers (address registers A0 to A6 and data registers D0 to D7) as well as the following:

stackpointer	<address>	pointer to stack
steappointer	<address>	pointer to steap
SR	<n>	status register
PC	<address>	address of next instruction in user code executed when task is scheduled to run
initial space	<n>	amount of space with which the task is initiated (that is, the value of the space parameter in the BNR Pascal INITIATE statement)

Queue options

A more detailed description of the queues can be obtained by specifying one or more of the appropriate options on the command line:

- IQ (for input queue)
- DQ (for defer queue)
- RQ (for rendezvous queue)
- EQ (for event queue)
- AQ (for agent queue)
- FQ (for free queue)
- Q (for all queues)

For each queue whose option is specified on the command line, the following information is produced:

- **queue <expanded task list>**
where: <expanded task list> consists of an expanded listing of each item on the queue.
- If the item is an event, the event count is output.
- If the item is a task or an agent, output from the debugger depends on the items state, as follows:

<u>state</u>	<u>output</u>
InterLocaleInvokeWait	the entry invoked by a task in another locale
InvokeWait	the entry invoked by a task in the same locale
ReplyWait	the entry in rendezvous
DeferWait	the entry being deferred
<all other states>	the state

- If the item is an agent, the following is produced:

Buffer size <n>	The size of the buffer (in bytes)
Parameter address <address>	The address of the parameters in the buffer
Parameters: <data>	The contents of the buffer used in task communication beginning with the parameter (that is, state machine information is not produced). The maximum number of bytes output is 32.

Agent information

Agents are used on behalf of a task to perform a rendezvous. SEND uses an agent to do a rendezvous, resulting in the agent suspending but not the task. Agents also represent a task in another node.

Agent	<agentid>	id of this agent
Remote Agent		
Rendez Agent		
Receiver Agent		
Send Agent		
locale	<n>	agent locale
state	InvokeWait	agent has invoked a task which has not accepted it yet
	DeferWait	agent has been deferred by accepting task
	ReplyWait	agent is in rendezvous
	RemoteInvokeWait	agent has invoked a task on another node
	RemoteInvokeExpired	remote invoke has timed out
	InterLocaleInvokeWait	agent has invoked a task in another locale
	Dead	task has terminated
parent	<poolid>	pool to which this agent belongs
buffer	<address>	buffer address associated with this agent
sender	<task>	name and taskid of the sender
reply enter	<n>	entry number to reply to in the sender
reply size	<n>	reply message size
arguments	<address>	address of arguments inside the buffer
next agent	<agent>	next agent in the pool

Pool information

Pools are a control structure to keep track of agents.

Pool	<poolid>	pool id
locale	<n>	pool locale
state	Allocated Dead	
parent	<task>	taskid of this pools parent (that is, who owns this pool)
agent size	<n>	agent size (in bytes)
free queue		
first agent	<agentid>	taskid of the next agent on free queue
# of agents	<n>	total number of agents on free queue
agent list		
first agent	<agentid>	taskid of first agent on list
# of agents	<n>	total number of agents on complete list of agents
next pool	<poolid>	taskid of next pool in queue of pools linked in a buffpool
agent size	<n>	agent size (in bytes) in the next pool

Information available through queue options

A complete list of the tasks on the agent queue and/or the free queue can be obtained by specifying the appropriate option on the command line:

- AQ for the agent list
- FQ for the free queue

Event information

Events are agents performing a rendezvous when a task does a RAISE.

Event	<eventid>	
locale	<n>	locale that this event runs in
state	InvokeWait	event has invoked a task but has not been accepted yet
	DeferWait	event is deferred by accepting task
	ReplyWait	event is in rendezvous
	Raise	event is raised
	Dead	
parent	<task>	taskid of this events parent (that is, task connecting this event)
event count	<n>	number of times this event is raised but not accepted

Timer information

Timers are agents invoking a task when a timeout expires. Timers invoke a task on behalf of the kernel.

Timer	<timerid>	
locale	<n>	timer locale
state	InvokeWait	timer has invoked a task but has not been accepted it yet
	DeferWait	timer is deferred by accepting task
	ReplyWait	timer is in rendezvous
	Raise	timer is raised
	Dead	
parent	<task>	taskid of this timers parent (that is, who started it)
notify	<task>	taskid to notify when this timer expires
next timer	<timerid>	next timer link
next action	<n>	next action the timer performs (valid only when handling timer calls within a handler)
next entry	<n>	next entry the timer invokes (valid only when handling timer calls within a handler)

Command summary

Breakpoint and trace commands

IBP <progno | *> <uname> <rname> [<lineno>] [+Kernel]

DBP

RBP [<bptno>]

Memory manipulation and examination commands

DM <virtual address> [<@locno>] [<n> [<wmod>]]

DML [--<backup>] <varno> [<n> [<wmod>]]

DMP [--<backup>] <varno> [<n> [<wmod>]]

DMG [--<unitname>] <varno> [<n> [<wmod>]]

DMT <varno> [<n> [<wmod>]]

SM <virtual address> [<@locno>] <wdrep> | <wmod> [<wdrep>]
[<wmod>]

SML [--<backup>] <varno> <wdrep> | <wmod>
[<wdrep> | <wmod>]

SMP [--<backup>] <varno> <wdrep> | <wmod>
[<wdrep> | <wmod>]

SMG <varno> <wdrep> | <wmod> [<wdrep> | <wmod>]

SMT <varno> <wdrep> | <wmod> [<wdrep> | <wmod>]

DR [<taskid> | <relid> | <name> [@<locale>]] + [R] [IQ] [DQ] [RQ]
[EQ] [AQ] [FQ] [Q]

CBADDR [<taskid> | <relid> | <name> [@<locno>]]

DTCB [<locno>] [ALL]

Miscellaneous commands

LISTPROG

G

M

KERNDEBUG

HISTORY

PAGESIZE <n>

NEWPROG [ON | OFF]

KILL < program number>

QUIT

Optional commands

MEM [<locno>]

HALT [ON | OFF]

PAGE [ON | OFF]

Chapter 30: Generic Telephony Interface Utility (gti_util)

The Generic Telephony Interface (GTI) provides a procedural interface for Meridian Mail applications to gain access to call processing functions on different switches. The Generic Telephony Interface utility (gti_util) provides commands that test the functions provided by the GTI and SMDI.

Three commands in this utility are useful for system support:

- GTIAUDIT sends out MWI messages for all mailboxes on a particular volume and SMDI link.

Note: SMDI links are supported only on SMDI-based platforms (that is, Modular Options GP and MSM *not* AML/CSL systems).

- GTIMWIUPDATE sends out an MWI message for a DN of a specified customer. The utility user specifies whether the MWI should be turned on or off.
- GTIDUMP can be used to look at data inside the SMDI task(s).

These are the only commands in this package that should be used.

Using gti_util

Gti_util is a Program Utility Package (PUP) level, command line utility. Use gti_util as described in Procedure 30-1.

Procedure 30-1

Using gti_util

- 1 Log in to the PUP level as described in Procedure 1-3 in Chapter 1, "Introduction."
- 2 At the "PUP>" prompt, type **GTI** to start the gti_util.
The ">" prompt appears.
- 3 Use the gti_util commands described below (GTIAUDIT, GTIMWIUPDATE, or GTIDUMP).
- 4 To end gti_util, type **quit** at the command line.
- 5 To log out of PUP level, type **pup** at the "PUP>" prompt.
After several seconds the MMI will restart.

Gti_util commands

Note: If you enter gti_util commands without parameters, you will be prompted to enter them one at a time. Parameters can be listed on the same line if you wish to skip the prompts. The examples below show the parameters entered with the command.

GTIAUDIT

GTIAUDIT is used to initiate an audit of Message Waiting Indicators (MWIs). It is useful to run this type of audit after there has been a link outage. During a link outage, MWI updates cannot be sent and the MWIs may become out of date during this period.

The utility allows the user to specify a "CheckTime". The CheckTime prompt is used to specify the date and time that the audit utility will use when checking user mail boxes. If a mailbox has been modified at a time since the specified CheckTime, that user's MWI will be updated. If the user's mailbox has not been modified since the CheckTime, the user's MWI will not be updated.

On Meridian Mail systems with SMDI links, the CheckTime typically indicates the time when the SMDI link last went down. MWI updates may be lost while the SMDI link is down. However, for a complete MWI update of all mailboxes, specify the time when the system was installed.

The audit utility has two update speeds: Fast and Slow. The Fast speed will send an MWI update every 0.4 seconds, while the slow speed will send an update every 4.0 seconds. The slow speed should be used if the audit is run during high traffic periods, in order to prevent overloading of call processing functions.

This same command is available from the System Administrators Tools level, but does not allow specifying all options.

Syntax: GTIAUDIT <command> <Link ID> <VolID> <CheckTime>

where:

Command	Action
SlowOnOnly	Turn MWI on only, do not send updates for off. Slow update.
FastOnOnly	Turn MWI on only, do not send updates for off. Fast update.
SlowOnOff	Turn MWI on and off. Slow update.
FastOnOff	Turn MWI on and off. Fast update.
StopMWIAudit	Stop the MWI audit.
AllOff	Turn all MWIs off.

Link ID is the name of the link to be audited. For example: 1, Link1, or Link2

VolID is the user volume to audit. Specifying “-1” will audit all volumes.

CheckTime is the earliest modification time to send an update for, as explained above.

Examples:

GTIAUDIT FastOnOff SMDI_1 -1 1994 1 1 1 0 0

This will start an audit of link “SMDI_1” for all volumes. Users whose mailboxes have been modified since January 1, 1994 at 1:00 will have MWI updates sent to turn their MWI on or off. An update will be sent every 0.4 seconds.

GTIAUDIT SlowOnOff 1 202 1994 2 1 3 0 0

30-4 Generic Telephony Interface utility (gti_util)

This will start an audit of link '1' for volume 202. Users who's mailboxes have been modified since February 1, 1994 at 3:00 will have MWI updates sent to turn their MWI on or off. An update will be sent every 4 seconds.

GTIMWIUPDATE

GTIMWIUPDATE is used to turn on or off the MWI of the telephony device with the specified DN. The link ID of the link used to send the update message must be provided to allow support for multiple SMDI links.

Syntax: GTIMWIUPDATE <DN> <DNType> <Customer Number>
<ON|OFF> <LinkID>

where:

DN is the DN of the terminal

DNType is one of: Unknown, InNa, Nat, Spec, Subs, ESN, CDP, Revr, Internal, RnM, NACD, Att, ACDP, DNIS, IANI, INANI, ACDDN

Customer number is the Meridian 1 customer number.

LinkID is the name of the link to be audited. For example: 1, Link1, or Link2.

Example:

GTIMWIUPATE 1234 Unknown 0 ON 1

This will turn on the MWI indicator for DN 1234, customer number 0. The update will be sent on Link ID 1.

GTIDUMP

GTIDUMP can be used to look at data inside the SMDI or CSL task(s).

Syntax: GTIDUMP <CCB>|<ChannelTable>|<OMs> <OPTIONS>

where:

CCB is the gti call control block used in the driver. The information in the CCB will not be useful for ETAS.

Channel table is the login table for the specified link handler.

Customer number is the Meridian 1 customer number.

OMs are link-specific operational measurements. (Currently, only SMDI is supported.)

Options:

If you select ChannelTable, input the link type (CSL|SMDI). If the link type is SMDI, also enter the LinkID.

If you select OMs (operational measurements), enter the LinkID.

Examples:

GTIDUMP ChannelTable CSL 1

This dumps GTI information for a specified channel table and link ID "1."

GTIDUMP OMs 1

Dumps GTI information for OMs with link ID "1."

30-6 Generic Telephony Interface utility (gti_util)

555-7001-260 Standard 1.0 January 1998

Chapter 31: Hospitality Administration Server driver (has_driver)

**CAUTION****Risk of loss of data or service**

The has_driver is intended to be used solely as a designer utility. Use it on a “live” system at your own risk.

The has_driver simulates Hospitality Voice Service (HVS) commands sent from the Property Management System (PMS) or a Guest Administration Terminal (GAC) to the Hospitality Administration Server (HAS). For example, you can check in a room, check out a room, copy mailboxes from one room to another, set text message counters, and view the list of Post Checkout (PCO) cabinets that are accessible from the Post Checkout service.

It is assumed that you are familiar with the Hospitality environment and the functions provided by MHVS. Further details can be found in the PMSI specifications, the *HVS GAC Guide* (NTP 555-7001-222) and the *HVS Implementation Guide* (NTP 555-7001-221).

Using has_driver

Meridian Mail must be running as the has_driver uses the other HAS tasks to complete its operations. To invoke has_driver from the ETAS level menu, follow Procedure 31-1.

Procedure 31-1

Starting up has_driver

- 1 Select the Helix Command Interpreter from the ETAS level menu.
- 2 Press <Ctrl>—<W> to activate the Cobra control window.
- 3 Use the up arrow or down arrow to move the cursor to “ci,” and press <Return>.
- 4 Type **fork has_driver** and press <Return>.
- 5 Press <Ctrl>—<W> to go to the Cobra control window.
- 6 Use the up arrow or down arrow to move the cursor to “has_driver,” and press <Return>.

The “>” prompt appears.

Procedure 31-2

Removing has_driver

Note: To gracefully exit the utility, type **quit** at the > prompt before removing the utility.

- 1 Press <Ctrl>—<W> to go to the Cobra control window.
 - 2 Use the up arrow or down arrow to move the cursor to “has_driver,” and press <R> to remove has_driver.
 - 3 Press <y> to confirm that the item should be removed.
- The item is removed from the Cobra control window.*
- 4 Use the up arrow or down arrow to move the cursor to “MMI,” and press <Return>.

You are returned to the MMI.

Has_driver command types

Has_driver commands normally give some indication of success or failure. The results of a successful command are noted after the command description.

There are two sets of commands:

- HAS commands emulate commands from a PMS or a GAC. Has_driver responses usually start with "***".
- PCO commands are used to search for, or view, PCO cabinets.

Has_driver command summary

The following functions are performed by has_driver commands. Each command is explained in its own section.

Function	Has_driver command
Audit PCO cabinets	hasaudit
Change a guest's name	hasnmchg
Check in a guest	hasin
Recheck in a guest or restore a guest	hasrechin
Check out a guest	hasout
Display OM statistics for hospitality services	hasom
Display a list of PCO cabinets	pcoprint
Copy an entire mailbox, or just messages, to another mailbox	hascp
Query the voice message count	hasqvm
Set the text message waiting indicator off	hasmwioff
Set the text message waiting indicator on	hasmwion
Shut down HAS	hasshutdown
Display a PCO cabinet matching certain criteria	pcosearch
Display the next matching PCO cabinet	pconext
Unlock a locked PCO mailbox	pcounlock
Note: A PCO mailbox is locked when accessed by the PCO service. When the call is normally terminated, the mailbox is unlocked. If for some reason (for example, the channel crashes), the PCO mailbox remains locked, then this command can be used.	

Note: As is the case with other ETAS utilities, you can enter has_driver commands with or without parameters on the command line.

31-4 Hospitality Administration Server driver (has_driver)

If you enter a command with an incomplete list of parameters, you are prompted for the remaining parameters one at a time.

The examples below show the parameters entered on the command line.

Has_driver parameters

Several has_driver commands require clientType and either room DN or mailbox number as parameters.

Valid clientTypes are PLH for PMS commands
 FDC for GAC commands
 VMSU for Voice Messaging

If clientType is PLH, then roomDN is required, otherwise the mailbox number is required.

Note: The mailbox number is identical to the room number, which may be different from the room DN.

In most cases, clientType should be FDC.

Has_driver commands

Has_driver commands normally give some indication of success or failure. The results of a successful command are noted after the command description. Has_driver responses usually start with "***".

The following sections describe the commands.

HASAUDIT <readAudit|unreadAudit>

This command forces a read or unread audit of the PCO cabinets to delete messages that have exceeded the default retention time.

For example, to delete only read messages, type the following:

```
HASAUDIT read <Return>
```

To delete unread and read messages, type

```
HASAUDIT unread <Return>
```

The progress of the audit is shown by information SEERs.

HASIN <clientType> <name> <roomDN|mailbox>

This command checks in a guest.

For example, to check in John Doe to room 8050, type

```
HASIN FDC "DOE,JOHN" 8050 <Return>
**CheckIn DONE ** Cmd:n Room: 8050 Name: Doe,John; numCmd tsks: n
```

HASOUT <clientType> <roomDN|mailbox>

This command checks out a guest.

For example, to check out the occupant of room 8050, type

```
HASOUT FDC 8050 <Return>
**Checkout DONE ** Cmd:n Room: 8050; numCmd tsks: n
```

HASRECHIN <clientType> <roomDN|mailbox>

This command rechecks in or restores a guest who was checked out, and restores mailbox contents including password, personal verification and so on.

For example, to recheck John Doe into the room 8050 after he was checked out, type

```
HASRECHIN FDC 8050 <Return>
**CheckIn DONE ** Cmd:n Room: 8050; numCmd tsks: n
```

HASCP <clientType> <copyType> <fromRoomDN|fromMailbox> <toRoomDN|toMailbox>

This command copies the whole mailbox (<copyType> = copyAll) or just messages (<copyType> = copyMsg) from one room to another.

copyAll includes messages, greetings, password (if it has been changed) and personal verification.

31-6 Hospitality Administration Server driver (has_driver)

For example, to copy to room with DN 2201 the entire mailbox belonging to the room with DN 2200, type

```
HASCP PLH COPYALL 2200 2201 <Return>
**Copy DONE ** Cmd:n Room: 2200 Name: Doe,John; numCmd tsks: n
```

HASNMCHG PLH <name> <language> <roomDN>

This command changes the name and language of a room.

Language is a number corresponding to the order of languages displayed on the Voice Messaging Options screen.

For example, if there are two languages ENGLISH and GERMAN, then 1 corresponds to ENGLISH and 2 to GERMAN.

For example, to change the name of the occupant of the room with DN 8050 to Fred Humble, and to change the language used by voice messaging to English, type

```
HASNMCHG PLH "HUMBLE,FRED" 1 8050 <Return>
**Name Change DONE ** Cmd:n Room: 8050 Name: Humble,Fred; numCmd tsks: n
```

Note: ClientType must be PLH for this command.

HASMWION <mailbox>

This command sets the text message notification flag on (which sets the MWI on).

For example, to set the text message notification for room 8050, type

```
HASMWION 8050 <Return>
** MWI should be on ** MBox: 8050 Name: Blow,Joe
```

HASMWIOFF <mailbox>

This command sets the text message notification flag off (which sets the MWI off).

For example, to set the text message notification off for room 8050, type

```
HASMWIOFF 8050 <Return>
** MWI should be off ** MBox: 8050 Name: Blow,Joe
```

Note: This command does not turn off the MWI if there are new (unread) voice messages in the mailbox. However, the response is still “MWI should be off.”

HASQVM <mailbox>

This command sends a “query voice count” message to HAS. The query is acted on in the same manner as if it had been received from the PMS (that is, the voice count information is sent to the PMS).

For example, to display the number of messages in mailbox 8050, type

```
HASQVM 8050 <Return>
** QV issued ** MBox: 8050
```

HASOM

This command displays OM statistics since the last time statistics were requested.

For example

```
HASOM <Return>

ChkIns = n                # of checkins processed
ChkOuts = n               # of checkouts processed
ExpMBox = n               # of PCO cabinets that expired (and were
                           removed)
NewUnreadEnt = n          # of mailboxes added to PCO
PCOCabNum= n              # of PCO cabinets
PCOCabSummary.VoiceMin = m # of minutes of voice storage used in the PCO
                           cabinet
PCOCabSummary.ReadVM = n  # of read messages in PCO
PCOCabSummary.UnreadVM = n # of unread messages in PCO
```

HASSHUTDOWN

This command asks the HAS server to shut itself down.

It is not restarted automatically, and all hospitality functionality is lost.

PCOPRINT

This command displays the entire PCORList.

For example

```
PCOPRINT <Return>

record n  offset m
    MBox 2200  surName Blow language 1  codeName 2569  date 6/1 8:0:6 0
    read 0  unread 2  locked 0  lockExp 6/2/94 12:00:00
    fid .1.12448.12420  detailFID .0.1.0

record p  offset q
    MBox 2201  surName Bloggs language 1  codeName 256447  date 6/1 8:1:7 0
    read 1  unread 1  locked 0  lockExp 6/3/94 12:00:00
    fid .1.12448.22420  detailFID .0.1.0
```

Note: codeName is the “name dial” number for the surName.

PCOSEARCH <month> <day> <hour> <minute> <second> <unique> <mailbox> <nameType> [<Name>] <lock>

Search the PCORList using the key specified.

Month, day, hour, minute, second, and unique refer to the checkout time.
255 may be used as a wild card for any of these fields.



CAUTION

Risk of utility failure

Entering an invalid date for the date and time segments will cause this utility to crash.

<nameType> can be NoName, SurName or CodeName.

Note: NoName is strongly recommended.

If nameType is SurName, then Name is the CodeName.

If nameType is CodeName, then Name is the SurName.

If nameType is NoName, then Name is not used.

Always use has_cNoLock for the lock parameter, otherwise you may prevent a guest from logging in to the pco mailbox.

For example

```
PCOSEARCH 255 255 255 255 255 2200 NoName has_cNoLock <Return>

MBox 2200  surName Blow language 1  date 6/1 8:0:6 0
read 1  unread 1  more 1  match 1
pcofid .1.10404.16115  detailFID .0.1.0

'more' is non-zero if more than one entry matched the search criteria
'match' shows the position of the displayed record in the list of matches
the detail fid shows if a spoken name was recorded
```

PCONEXT

This command displays the next entry that matches the last criteria used in a pcosearch command. The first pconext command must be preceded by pcosearch.

For example

```
PCONEXT <Return>

MBox 2201  surName Bloggs language 1  date 6/1 8:1:7 0
read 0  unread 2  more 0  match 2
pcofid .1.10424.16215  detailFID .0.1.0

'more' is non-zero if more than one entry matched the search criteria
'match' shows the position of the displayed record in the list of matches
the detail fid shows if a spoken name was recorded
```

Note: PCONEXT can only be used if the “more” field in the last pcosearch or pconext command is greater than zero.

PCOUNLOCK

This command unlocks the last PCO entry found using pcosearch or pconext.

Use this command when a guest attempts to access messages using the PCO service but is told that the mailbox is in use. When it is determined that no one else is logged into the PCO mailbox, unlock the mailbox using pcounlock.

For example, to unlock the mailbox for the PCO record last found:

```
PCOUNLOCK <Return>
Data unlocked if locked
```

Glossary

FDC

Front Desk Console. Also known as GAC.

GAC

Guest Administration Console. A terminal used for guest room maintenance. Also known as FDC.

HAS

Hospitality Administration Server. A software component that processes commands such as checkins, checkouts, and so on.

PCO

Post CheckOut cabinets refer to guest cabinets that have been moved when guests check out so that the messages can be later retrieved by the Post CheckOut service.

PMS

Property Management System. A hotel's computer system.

PMSI

PMS Interface. A link connecting Meridian Mail to a PMS or to a Meridian 1. Messages are sent on the PMSI indicating rooms being checked in, and so on.

PLH

PMSI Link Handler. A software component that translates PMSI messages to HAS commands (such as checkins, and so on).

31-12 Hospitality Administration Server driver (has_driver)

Chapter 32: Multibuffer editor (med_pkg)

Overview

Med_pkg is a CLI software package that contains the multibuffer editor. The multibuffer editor is a full-screen text editor that allows you to edit Helix ASCII files (usually those found on Volume 1 of Meridian Mail). Med_pkg provides a variety of text processing commands and allows up to ten files to be edited at the same time.

Med_pkg can be used to

- edit various Meridian Mail configuration files (such as startlist, vss.pd.text, or osp.pd.text).
- create CLI *execs* (or executable files) to automate routine tasks. Examples of md_dr execs are provided in Chapter 9.

This chapter provides all necessary instructions for using med_pkg. To better understand the Meridian Mail command interpreter and the uses for med_pkg, you should refer to the *CLI User Manual and Programmer's Guide* (document number TD 87001).



CAUTION

Risk of system damage

1. Med_pkg allows you to edit important system configuration files. Use care when using med_pkg or you could damage important system files.
2. When using med_pkg, the entire Meridian Mail file system (directories and files) can be read from, written to, deleted, or moved. Be careful not to do anything which could damage the system you are working with.
3. Make copies of the files you intend to edit.

Starting med_pkg

To start med_pkg, follow procedure 32-1.

Procedure 32-1

Starting med_pkg

Starting Point: Meridian Mail Logon screen

- 1 Log into ETAS level as described in Procedure 1-1.
- 2 Type in the command for the Helix Command Interpreter **ci** and press **<Return>**.
- 3 Enter the Window Manager (Ctrl-W) and use the arrow keys to go to the new window created for the Helix Command Interpreter.
- 4 Type **rw100** and press **<Return>** to make Meridian Mail's files editable.
The system loads the Helix package (hx_pkg) and the helix read/write server (rw100). The Helix package contains the most commonly used file and directory handling functions (such as listing, copying, or deleting) for the Meridian Mail operating system. For more information on hx_pkg, refer to the CLI User Manual and Programmer's Guide.
The prompt changes to "RW100>".
- 5 Make a backup copy of the file you intend edit in med_pkg, using the hx_pkg file handling commands described in the *CLI User's Manual*.
For example, if you will be working on the file "startlist," make a copy called "startlist.old," This way if you damage the file while editing, you

can revert to the old version by deleting the current file and renaming "startlist.old" back to "startlist."

- 6 Type **load med_pkg** and press **<Return>** to load the editor.
The "Package MED_PKG loaded" message appears telling you that the multibuffer editor is loaded.
 - 7 There are four possible ways to start the editor:
 - open an existing file—go to step a.
 - open multiple new or existing files—go to step b.
 - open a new file—go to step c.
 - open an empty, unnamed file—go to step d.
 - a. Type **ed :directory:filename** and press **<Return>** to edit a file, where
 - *directory* is the path to the file you wish to edit. This is optional. If you do not enter the directory path, med_pkg will attempt to find the file in the current default directory and if it fails to find the file it will create a new one.
 - *filename* is the name of the file you wish to edit
- For example, typing **ed :rw100:pd:startlist** would allow you to edit the system file "startlist" in the subdirectory :rw100:pd.
- You will see a screen similar to the one below.*

32-4 Multibuffer Editor (med_pkg)

```
basedir      :BOOT100
vcm          multiserver 1    1    '10'          critical
vs           multiserver 1    1    'M 2 FAST SCSI' rest!
rsm_hdlr     overlay 1    1    'NOCLOCK'      ignore
of_server    multiserver 1    1    '+2 12 15 0'   ignore
csl          overlay 1    1    '20'          ignore
vom_pp       overlay 1    1    ''            ignore
testrbd      schedule 1    1    ''            unload
rdb_ovl      overlay 1    1    ''            restart
testvp8      schedule 1    1    ''            unload
testnvp      schedule 1    1    ''            unload
mmi_server   multiserver 1    1    ''            cr!
mmi          service 1    1    '<<:console:mmi >>' :console:mmi:boot100:!
tc           overlay 1    1    'prime'       ignore
om_server    multiserver 1    1    ''            re!
mt           multiserver 1    1    'SCSI_1_1_2'   critical
dr_server    multiserver 1    1    'SCSI'        rest!
as_server    service 1    1    ''            critical
vphp         service 1    1    '1 10'        critical
&mmltkm      multiserver 1    1    'prime'       critical
&fm          multiserver 1    1    'SCSI 2'      critical
&ocs         multiserver 1    1    'SCSI_V8_2_M_2_1_2' critical
vss          schedule 1    10    ''            restart

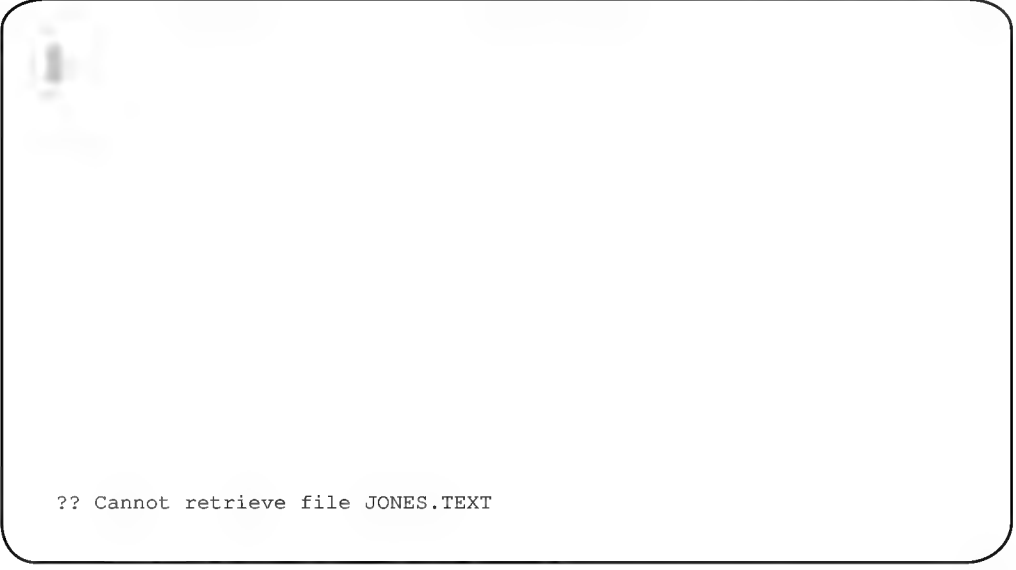
:RW100:PD:STARTLIST (1) 1 of 24 lines    Not changed
```

- b. Type **ed file1 file2 file3** and press **<Return>** (where *file1 file2 file3* are different existing or new filenames—you may also include the directory paths) to open multiple files in different file buffers. For more details on using multiple file buffers, see the section entitled “Editing multiple files” on page 32–13.
- c. Type **ed newfilename** and press **<Return>** (where *newfilename* is a file that doesn’t exist—you may also include the directory path) to create a new file.

Note: If you do not enter a file extension for a new file, med_pkg defaults to the extension “.text”, so entering **ed jones** will create a file named “jones.text.” To prevent med_pkg from adding the default extension, you must end the file name with a period. For example, entering **ed jones.** creates a file called “jones”.

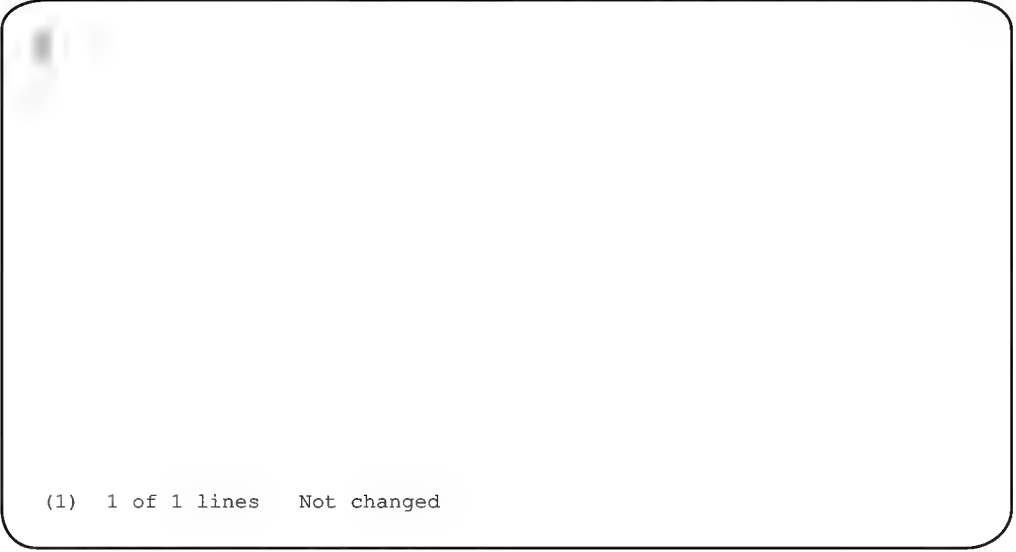
An exception to this rule is creating an executable file. In this case, you may simply enter the “.exec” file extension and med_pkg will not put “.text” at the end. For instance, entering **ed jones.exec** will create a file named “jones.exec”.

You will see a screen similar to the following:



?? Cannot retrieve file JONES.TEXT

- d. Type **ed** and press **<Return>** to work on an empty, unnamed file.
You will see a screen similar to the following:



(1) 1 of 1 lines Not changed

32-6 Multibuffer Editor (med_pkg)

You are now ready to create or edit your file as described in the following sections.

Basic concepts

This section describes the basic text processing features of med_pkg and provides an introduction to med_pkg commands.

Typing text

When you start med_pkg, you will see a screen similar to the following:

Figure 32-1
Med_pkg editing screen elements

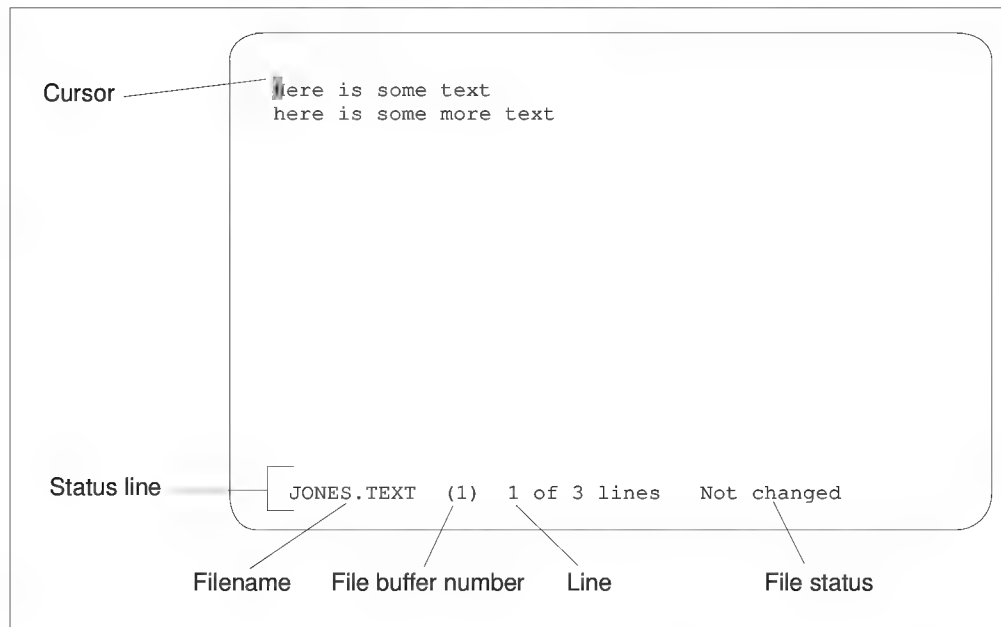


Figure 32-1 shows a typical screen you would see in a med_pkg editing session. The *cursor* is the small, blinking rectangle in the upper-left corner of the screen. On some terminal configurations it could also be a blinking underline, or not appear at all; however, it will always initially be in the upper left corner of the screen. The *status line* at the bottom of the screen shows the name of the file you are working on, the file buffer you are working in, your location (line number) in the file, and the status of the file. The status line may also show messages notifying you of the outcome of a command (such as saving a file), or prompt you for more information.

To enter text, just type in alpha or numeric characters from the keyboard of your terminal. The text you enter appears to the left of the cursor. When you reach the end of a line, the text will automatically wrap to the next line (unless you turn off auto return mode, as described later).

The following keys are useful for basic text entry:

- <Delete>** Deletes the character to the left of the cursor (deletes backwards)
- <Backspace>** Deletes the character to the right of the cursor (deletes forwards)
- <Esc>** Undoes the last deletion

Note: The **<Tab>** key in med_pkg is used to enter commands, such as those described below. You cannot use it to insert a tab character. To tab text in med_pkg you can either use spaces, the **<Tab> [n] >** command (described later), or define a PF-key macro (also described later).

Accessing commands

Almost all of med_pkg's commands are accessed by pressing the **<Tab>** key followed by a character key. For example, to quit you would press **<Tab>** then press **q**.

Note: Commands are case sensitive. **<Tab> b** is different from **<Tab> B**.

In many cases, you may also enter a number with the command as a parameter or a repetition count. To do this you press **<Tab>**, then the number, then the character for the command. For example, to jump to line number 15 in a file you would press **<Tab>**, then press **15**, then press **=**. The cursor will then move to line 15.

The following sections describe the **<Tab>** commands. When using commands shown with a bold, italicized "n" in square brackets (**[n]**), you may enter a prefix, where *n* is a number (if you do not enter a prefix, med_pkg uses the default value of 1 for *n*). The effect of the prefix is described in brackets following the description of the command. For example,

<Tab> [n] j jump back one word (or *n* words)

If you wish to cancel a command, press **<Esc>**.

You may also enter *command mode*, by pressing <Tab> then <Esc>. In command mode, you may continuously enter commands without pressing <Tab> before each new command. Press <Esc> to exit command mode.

Moving around

The easiest way to move around in your file is to simply use the cursor keys (left, right, up, and down arrow keys) to move the cursor one character at a time. To save time, however, med_pkg provides the following commands as shortcuts:

<Tab> [	goes to start of the current line (column 1)
<Tab>]	goes to the end of the current line (column 79)
<Tab> ,	goes to the start of text on the current line
<Tab> [n] =	jumps to absolute line number <i>n</i> in file
<Tab> b	goes to the bottom of the current file buffer
<Tab> [n] j	jumps back one word (or <i>n</i> words)
<Tab> [n] p	moves one page forward (or <i>n</i> pages forward)
<Tab> t	goes to the top of the current file buffer
<Tab> [n] u	moves one page up (or <i>n</i> pages up)
<Tab> [n] w	goes forward one word (or <i>n</i> words)

Editing text

If you want to change existing text, or make a mistake when entering text in a file, med_pkg provides the following commands to simplify text editing:

<Delete>	deletes the character to the left of the cursor
<Backspace>	deletes the character to the right of the cursor
<Esc>	undoes (cancel) the last deletion
<Tab> [n] >	adjusts text one space to the right (or <i>n</i> spaces to the right) from the point where the cursor is resting
This command also moves over all lines of text underneath the line the cursor is on (in other words, it indents the text). Use <Tab> [n] < to move text on subsequent lines back.	
<Tab> [n] <	adjusts text one space to the left (or <i>n</i> spaces to the left) from the point where the cursor is resting

- This command also moves all subsequent lines of text one space left (or *n* spaces left)
- <Tab> [n] B** deletes back one word (or *n* words)
- <Tab> [n] D** deletes forward one word (or *n* words)
- The cursor must be at the beginning of the word.
- <Tab> E** erases the current file buffer (that is, it empties the file you are working on with no save)
- <Tab> d** deletes text until the end of the current line
- <Tab> i** switches to insert mode (this is med_pkg's default)
- Any characters you type in this mode will be inserted into the text from the point where the cursor is resting.
- <Tab> x** switches to exchange (overwrite) mode
- Any characters you type while in this mode will overwrite existing characters.
- <Tab> P** puts (saves) the current file buffer to the default directory (save without quitting).

Advanced commands

In addition to basic text processing commands, med_pkg provides more advanced commands to help you create or edit files faster and more efficiently.

Search and replace

Med_pkg's search and replace commands allow you to find specified text strings and replace them with new text, either one occurrence at a time or globally.

Commands

The following commands are available:

- <Tab> Q** queries search and replace strings and last I/O result
- When you enter this command, a message is displayed at the bottom of the screen showing the last string searched for, the last replacement string used, and the last I/O result.
- <Tab> R** replaces globally
- When you enter this command, you are prompted to enter the search and replace strings. See the explanation in the section entitled "Entering search and replace strings." Press **<Return>** to proceed.
- If the global search and replace is successful, a screen, similar to the one below, appears showing the changed lines.

```
1: {md_xl exec to display all distinct values of indexed field names
4: xlquiet
7: xlopen
10: xlsimpfind @1 +
21: xlnextentry
```

```
Global replace finished <hit space to continue>
```

Press the **<Spacebar>** to continue.

- <Tab> [n] f** finds the next occurrence of the text you specify
- When you enter the command, med_pkg prompts you for the text string you wish to search for. (Med_pkg will skip *n* occurrences if a prefix value is entered).
- <Tab> l** locates a pattern globally in the current file buffer
- You are prompted to enter a search string. Med_pkg presents a screen showing which lines contain the search string, similar to the screen shown above for **<Tab> R**.

<Tab> [n] r

replaces one occurrence at a time (or replace *n* times forwards)

When you enter this command, you are prompted to enter the search and replace strings. See the explanation in the section entitled “Entering search and replace strings.”

<Tab> [n] v searches and replaces with verification for each replacement

When med_pkg finds an occurrence of the search string, it prompts you to choose between quitting the operation (press <Esc>), replacing the string (press <Space>), or ignoring the occurrence and moving to the next (press <Return>).

Entering search and replace strings

When you use the replace commands (<Tab> **R**, **r**, and **v**) you are prompted to type the search and replace strings in the following format:

<delimiter><target string><delimiter><substitute string>[<delimiter>]

Where

<delimiter> can be either * or / (the final delimiter is optional)

<target string> is the text string you wish to search for, which can include the special pattern matching characters described below

<substitute string> is the new text you wish to replace the target string

For example, to replace the term “listdir” with “addir” you would type

listdir*addir or **/listdir/addir**

then press <Return>.

Pattern matching characters

Med_pkg provides a number of special pattern matching characters (wild cards) that you can use to broaden your searches when using the search and replace commands.

=	matches any string (0 or more characters)
?	matches any single character
\$	matches character at the beginning of line or end of line (depending on position in string)
~	<i>not</i> or negation (prefix operator)
*	0 or more repetitions (postfix operator)
+	1 or more repetitions (postfix operator)
[abc]	character class using a list
[a-c]	character class using a range
\	escape, used to obtain a literal character

For example, entering **H?ll** as a search string will find *Hill*, *Hell*, or *Hall*. Entering **\$H=ll=** will only find *Hill*, *Hello*, *Hall*, and so on, but only when they occur at the beginning of a line (**H=ll=\$** would find occurrences at the end of a line).

Using marks

Marks in med_pkg are bookmarks that allow you to jump to specific locations in your file and select ranges of lines to be saved to the save buffer. You can create up to nine different *levels* of marks (levels 1 to 9). Mark levels allow you to distinguish different marks in locations, so rather than having to move from one mark to another, you can, for example, skip directly to the next level 2 mark.

The following mark commands are available:

<Tab> [n] h	homes to next mark (or next mark of level <i>n</i> ; the default is level 1)
<Tab> [n] m	sets mark on current line at cursor location (or mark of level <i>n</i> ; the default is level 1)

Editing multiple files

One of med_pkg's main features is its ability to keep up to ten files open simultaneously in separate file buffers in the system's memory. Each buffer is numbered from 1 to 10, and each file buffer has an associated *save buffer*, also numbered 1 to 10.

32-14 Multibuffer Editor (med_pkg)

The save buffer can be used to save entire files or parts of files for insertion into the current file buffer, or other file buffers. This allows you to copy text from one file to another, move material from one location in a file to another, or repeatedly insert the same information into your file.

The following commands are available for handling multiple files:

**<Tab> ** exchanges the save buffer and file buffer

This switches the display to show you the contents of the current save buffer—you may also edit the save buffer. Press **<Tab> ** again to return to the file buffer.

<Tab> ? displays file buffer information

This command will display a screen showing the status of the current edit session and of each of the file buffers (also called “edit” buffers).

A screen similar to the following appears:

```
Program status
Version          : MED (Version 2.9.9) CLI Package
Segment allocated : 1
Edit mode        : INSERT
Search mode      : Pascal
Terminal mode    : COBRA
Auto <CR>        : ON

Current edit buffer : 3
Name                : :RW100:NEW.TEXT
Size                : 1 lines
Status              : Not changed

Edit buffer         : 1
Name                : :RW100:DELME.EXEC
Size                : 1 lines
Status              : Not changed

Edit buffer         : 2
Name                : :RW100:OTHER.TEXT
Size                : 1 lines
Status              : Not changed

<hit space to continue>
```

Press the **<Spacebar>** to continue.

- <Tab> I** inserts a file into the current save buffer
- Med_pkg prompts you to enter a filename. To check if the file was successfully inserted, use **<Tab> ** or **V**.
- <Tab> N** inserts a new file into the next free file buffer
- You are prompted to enter a filename.
- <Tab> P** puts the current file buffer to the default directory (in other words, the command saves without quitting)
- <Tab> V** views the current save buffer. This displays the contents of the save buffer
- You may not edit the save buffer from this screen.
- <Tab> [n] c** copies from the current save buffer to the current file buffer (or repeats the copy *n* times)
- This command is useful if you have a block of text which you must reuse a number of times in a file (such as a block of commands). Use **<Tab> I**, **<Tab> [n] s**, or **<Tab> [n] z** to place text in the save buffer.
- <Tab> [n] g** goes to the next file buffer, even if it is empty (or goes to *n* file buffer)
- <Tab> [n] k** copies from save buffer *n* to the current cursor position in the file buffer
- This allows you to insert material from another file buffer's save buffer into your current file as follows:
1. Use **<Tab> I**, **<Tab> [n] s**, or **<Tab> [n] z** to place text from the current file buffer to the current save buffer.
 2. Switch to a new file buffer using **<Tab> [n] n** or **g**.
 3. Use **<Tab> [n] k** to insert the material from the save buffer of the previous file buffer into the new current file buffer.
- <Tab> [n] n** advances to the next non-empty file buffer (or to file buffer *n*)

<Tab> [n] s saves the text from the line the cursor is on to the line the next level 1 mark is on (or the line the next *n* level mark is on) to the current save buffer

This command allows you to put a range of lines into the save buffer. See the section entitled *Using marks* for information on setting and finding marks.

<Tab> [n] z zaps (moves) from the line the cursor is on to the line the next level 1 mark is on (or the line the next *n* level mark is on) to the current save buffer

This command allows you to put a range of lines into the save buffer. See the section entitled “Using marks” for information on setting and finding marks.

Defining PF-Key macros

Med_pkg allows you to define macros that assign a command (or several commands) to a particular PF-Key on your keyboard. This can save you time by automating repetitive commands.

Note: Macros are not saved when you end an editing session. If you end your editing session, and restart med_pkg, you will have to reprogram your PF-Key macros.

Macro commands

The following command is used to define a macro:

<Tab> M defines a PF-Key macro.

1. You are prompted to press the PF-Key to which you wish to assign the macro.
2. You are then prompted to enter a string to define the command to be assigned to the PF-Key. The acceptable string values are described below.

The following sequences can be used to obtain nonprintable characters:

\T **<Tab>** (or use **\E** for **<ETX>**)—use this sequence to precede a **<Tab>** command. For example, **\Th** would be the same as **<Tab> h**—home to mark.

\! **<Esc>**

\U up cursor

\D	down cursor
\R	right cursor
\L	left cursor
\B	backspace
\N	carriage return
\X	
\<n>	PF-Key number (<i>n</i> must be between 1 and 9, or 0 for PF-10)
\	a literal '\ ' character

Note: These sequences may also be included in .EXEC files to obtain nonprintable characters. .EXEC files may contain any sequence of text and editor commands in addition to the above sequences. A '\ ' character placed at the end of a line may be used to obtain trailing blanks (the '\ ' will be discarded).

Sample macro

For example, to define a macro to indent text by five spaces, you would

- 1 Press **<Tab> M**.

A prompt appears at the bottom of the screen asking you to press the PF-Key you wish to program.

- 2 Press the PF-Key you wish to program (for instance, **<PF-5>**).

Med_pkg prompts, "Macro for PF-5:".

- 3 Type **\T5>** (the equivalent of a **<Tab> 5 >** command) and press **<Return>**.

- 4 Place the cursor at the beginning of a line of text and press **<PF-5>**.

The current line of text, and all those under it, will move five spaces to the right.

Changing defaults

A number of med_pkg defaults can be reset. The following commands allow you to change defaults:

<Tab> S	toggles search mode (TEXT or PASCAL—the default is PASCAL)
----------------------	--

32-18 Multibuffer Editor (med_pkg)

- <Tab> T** selects terminal type (the options are FALCO, ANSI, VT100, VT200, or HELIX—the default is FALCO)
- <Tab> W** sets working directory
You are prompted to enter a new directory.
- <Tab> a** toggles the status of auto return mode
If auto return is turned off, text can continue past the right border of the screen. Text that goes beyond the right border is truncated, as indicated by “!”—for example, “here is some truncated te!”.
- <Tab> ?** shows the current defaults, and the state of the current edit session
When you enter this command the following screen appears summarizing the current status:

```
Program status
Version      : MED (Version 2.9.9) CLI Package
Segment allocated : 1
Edit mode     : INSERT
Search mode    : Pascal
Terminal mode  : COBRA
Auto <CR>     : ON

Current edit buffer : 3
Name            : :RW100:NEW.TEXT
Size           : 1 lines
Status          : Not changed

Edit buffer      : 1
Name            : :RW100:DELME.EXEC
Size           : 1 lines
Status          : Not changed

Edit buffer      : 2
Name            : :RW100:OTHER.TEXT
Size           : 1 lines
Status          : Not changed

<hit space to continue>
```

Default definitions are contained in a file called MED.PROFILE which is read by med_pkg at program load time (if it is present). Editing this file will allow you to change start-up defaults.

Other commands

Several other useful commands also available within med_pkg are

- <Tab> @** executes an .EXEC file
You are prompted to enter the name of the .EXEC file.
- <Tab> H** displays help text
This displays several pages of help text.
- <Tab> U** Updates (refreshes) the screen
This can be used to clear unwanted messages from the status line. Messages on the status line will overwrite the file information on the status line; this command will return the display to the default.
- <Tab> q** quits the editing session (see Procedure 32-2)

Exiting med_pkg

To exit med_pkg, follow Procedure 32-2.

Procedure 32-2 Exiting med_pkg

Starting Point: med_pkg editing screen

- 1 Press **<Tab>** then press **q**.

The screen changes to the Quit menu shown below.

```
***QUIT
Current file -> MYFILE.TEXT

    buffer 1 changed

E - Exit
H - Hold (exit and leave buffers in memory)
N - New (discard current file, and edit a new one)
P - Put (save all changed file-buffers)
S - Save file using original file name
U - Update (save and exit)
W - Write out file with new file name
X - Error exit (set RETSTRING to "ERROR")
? - Display the state of the edit session
<CR> - Return to the current file-buffer
<n> - Go to file-buffer <n>, where n is 1..9

->
```

To select an option from this menu, press the associated key. You *do not* have to press **<Return>**. These commands are *not* case sensitive.

The options from this menu function as follows:

- *Exit (E)* exits the editor without saving any of the file buffers. You are prompted whether you wish to discard your edits.
 - *Hold (H)* exits med_pkg, but leaves the file buffers in memory. If you reenter med_pkg, your files are redisplayed.
 - *New (N)* discards the current file, and begins editing a new file.
 - *Put (P)* saves all changed file buffers, then returns to current file buffer.
 - *Save (S)* saves the file using the original file name.
 - *Update (U)* saves the file buffers to the default directory and exits med_pkg.
 - *Write (W)* writes out file with a new file name; you are prompted to enter a new file name.
 - *Error exit (X)* exits the session and sets the variable RETSTRING to "ERROR".
 - *?* displays the state of the edit session.
 - *<CR>* returns you to the current file-buffer without exiting or saving your file (cancel the quit operation).
 - *<n>* goes to the file-buffer specified by *n*, where *n* is 1 to 9. This is the same as the *<Tab> [n] g* command.
- 2 Press **E**, **H**, **U**, or **X** to exit the editing session.
You are returned to the ">" prompt.
 - 3 Type **unload med_pkg** and press **<Return>** to remove the editor from memory.
 - 4 Type **rw100 shutdown no** and press **<Return>** to shut down the read/write server.
The system reloads hx_pkg and returns to the ":BOOT100>" prompt.
 - 5 Type **<Quit>**.

- 6 Enter the Window Manager (CTRL-W), remove the window used by the Helix Command Interpreter, and use arrow keys to return to the window for the ETAS level commands.

Result: You are at the ETAS level command screen

- 7 Press the [Exit] key to return to the Meridian Mail Logon screen.

The system will take several seconds to return to the Logon screen.

Command summary

Table 32-1 provides a summary of all commands available with the <Tab> prefix or in command mode (<Tab> <Esc>).

Note: Commands are case sensitive. <Tab> **b** is different from <Tab> **B**.

“●” in the “Prefix” column means the command may be used with a numeric prefix (either as a parameter or a repetition count).

Table 32-1
Med_pkg command summary

Key	Prefix	Description
<Esc>		Enter command mode
<Backspace>	●	Delete the current line (or the line number you specify with the prefix)
@		Execute an .EXEC file
[		Go to start of current line (column 1)
]		Go to end of current line (column 79)
,		Go to start of text on current line
\		Exchange the save buffer and file buffer
<	●	Adjust text to the left
>	●	Adjust text to the right
=	●	Jump to absolute line number in file
?		Display file buffer
B	●	Delete back one word (or the number of words you specify with the prefix)
D	●	Delete forward one word (or the number of words you specify)
E		Erase the current file buffer
H		Display help text
I		Insert new file into the current save buffer
M		Define a PF-key macro
N		Insert a new file into the next free file buffer
—continued—		

Table 32-1 (continued)
Med_pkg command summary

Key	Prefix	Description
P		Put the current file buffer (in other words, save without quitting)
Q		Query search and replace strings, and last I/O result
R		Global replace
S		Toggle search mode (TEXT or PASCAL, PASCAL is the default)
T		Select terminal type (the options are FALCO, ANSI, VT100, VT200, or HELIX—the default is FALCO)
U		Update (refresh) the screen
V		View the current save buffer
W		Set working directory
a		Toggle status of auto carriage return mode
b		Go to the bottom of the current file buffer
c	•	Copy from the save buffer to the current position in the file buffer
d		Delete text until end of line
f	•	Find
g	•	Go to the specified file buffer
h	•	Home to a specified mark
i		Select insert mode
j	•	Jump back one word
k	•	Copy from the specified save buffer to the current position in the file buffer
l		Locate pattern globally in file buffer
m	•	Set mark on current line (or set mark of level specified)
n	•	Advance to the next non-empty file buffer (or the file buffer number specified in the prefix)
p	•	Move one page forward (or move forward the number of pages specified in the prefix)
q		Quit
r	•	Replace
—continued—		

Table 32-1 (continued)
Med_pkg command summary

Key	Prefix	Description
s	•	Save text between named marks in save buffer
t		Go to top of the current file buffer
u	•	Move one page up (or move up the number of pages specified in the prefix)
v	•	Verifying replace
w	•	Go forward one word (or the number of words specified in the prefix)
x		Select exchange (replacement) mode
z	•	Zap (delete) text between the specified marks
—end—		

Chapter 33: C25 Utility (c25util)

Overview

C25util is a multifunction utility usually used by Meridian Mail developers for porting digital signal processing (DSP) software to the Meridian Mail platform and for developing and testing new DSP hardware. The Signaling Interface Monitor (SIM) utility, which is bundled with c25util, has proven to be a useful troubleshooting aid for diagnosing problems with General-purpose Signal Processing (GSP) boards (both NT4R04AB and NT4R04AA) in the field. GSP boards are used in the following systems:

- Modular Option GP

Field problems that this utility can help with are

- checking the loop start/ground start line type configuration switches on the GSP card without having to remove the card
- checking to see if the lines connected to the GSP card are of the proper type (loop start or ground start)
- determining the Tip debounce timing values required when interfacing with new third-party switches
- checking to see if events such as 20 Hz ringing on one telephone line are somehow coupling into other lines or GSP card signaling interfaces on the same node
- providing a faster real-time line status display (idle/active) than the PUP level DSP Port Status can provide
- checking cabling problems between the GSP card and a main distribution frame (MDF)
- checking how long it takes the Central Office (CO) to remove 20 Hz ringing from the line after the line has gone off-hook

33-2 C25 Utility (c25util)

The signaling Interface Monitor (SIM) provides a real-time display of the status of the ground start or loop start lines connected to the GSP card, along with the status of the signaling interface relays on the GSP card. Once the SIM has been started, it keeps a record in memory of any status changes that occur. This allows the recorded status changes to be captured and replayed for detailed analysis after an event of interest has occurred.

Menus are used throughout the utility whenever user input is required.

ATTENTION

C25util is intended for use primarily by Meridian Mail developers. As you use the utility you will see menu options which are not documented. *Do not* attempt to use these options—they may not work reliably outside the development environment. Use only the features documented here.

Ground start and loop start signaling operation

Each GSP card signaling interface includes three relays for controlling the hook status of the line: a DIP switch for configuring the line as either a loop start or a ground start line, and a set of line status detectors for determining the state of the telephone line.

The three relays are referred to as K1, K2, and K3 for all four lines coming into the GSP card. These relays have the following states:

- K1 relay (0 = off hook, 1 = on hook)
- K2 relay (0 = normal, 1 = ring grounded)
- K3 relay (0 = no detectors, 1 = detectors active)

The loop start/ground start selector DIP switch (S5 on both NT4R04AB and NT4R04AA) has a value of 0 (off) to configure the line as a ground start line, or 1 to configure the line as a loop start line. Refer to the *Meridian Mail Modular Option GP Installation and Maintenance Guide* (NTP 555-7051-250) for more information on the GSP card's DIP switch settings on the Modular Option GP platform.

The state of the line status detectors is read by the DSP via two bits in a status register, which have the meanings shown below ("X" means the value of the bit does not matter):

Register			Meaning
RING	TIP	K1	
0	0	0	battery reversal
0	0	1	20 Hz ringing
1	0	X	normal battery, Tip grounded
1	1	X	Tip open

The K1, K2, and K3 relays are used together to control the hook state of the signaling interface.

33-4 C25 Utility (c25util)

The following chart shows a typical sequence of events for a call on a loop start line:

Register	Column						
	A	B	C	D	E	F	G
K1	1	1	0	0	1	0	1
K2	0	0	0	0	0	0	0
K3	1	1	0	0	0	0	1
TIP	0	0	0	0	0	0	0
RING	1	0	0	1	1	1	1

Each column shows

- **A**—an idle on-hook channel connected to a loop start line
- **B**—20 Hz ringing on the line (either loop start or ground start)
- **C**—the channel going off-hook to answer the call
- **D**—the central office removing 20 Hz ringing from the line now that it is off-hook
- **E and F**—a flash-hook being executed (K1 goes to 1 for 300 milliseconds, followed by K1 going to 0)

Note: The flash hook duration is determined by a field in the hardware database.

- **G**—the channel going on-hook to hang up on the call

The following chart shows a typical sequence of events for a call on a ground start line

Register	Column					
	A	B	C	D	E	F
K1	1	1	1	0	0	1
K2	0	0	0	0	0	0
K3	1	1	1	0	0	1
TIP	1	0	0	0	1	1
RING	1	1	0	1	1	1

Each column shows

- **A**—an idle on-hook channel connected to a ground start line
- **B**—the tip conductor going active due to an incoming call
- **C**—20 Hz ringing on the line
- **D**—the channel going off-hook to answer the call
- **E**—the caller hanging up (disconnect)
- **F**—the channel going on hook

The following chart shows a typical sequence of events for Meridian Mail originating a call on a ground start line:

Register	Column				
	A	B	C	D	E
K1	1	1	1	0	0
K2	0	1	1	1	0
K3	1	1	1	0	0
TIP	1	1	0	0	0
RING	1	1	1	1	1

Each column shows

- **A**—an idle on-hook channel connected to a ground start line
- **B**—Meridian Mail grounding the ring conductor (K1 at 1) to seize the line
- **C**—the tip conductor being grounded by the central office to indicate that the line has been seized
- **D**—Meridian Mail going off-hook momentarily with the ring still grounded
- **E**—the ring conductor being released, completing the original call sequence

Starting c25util and accessing the Signaling Interface Monitor (SIM)

Follow Procedure 33-1 to start up c25util and access the Signaling Interface Monitor (SIM).

Procedure 33-1

Starting c25util and accessing the SIM

Starting point: Logon Screen

- 1 Log into the PUP level as described in Procedure 1-3 in Chapter 1, "Introduction."
- 2 To start up c25util on the node containing the GSP card(s) to be monitored, type **c25util [n]** at the "PUP>" prompt and press <Return> (where *n* is the node number, for example, to start c25util up on node 2 type **c25util [2]**).

The introductory menu shown below will appear:

```
C25UTIL          VERSION 93.05.27
N > NVP
G > GSP
D > DVP
4 > VP4
8 > VP8

Select Card type > g
```

ATTENTION

C25util is intended primarily for use by Meridian Mail developers. As you use the utility you will see menu options which are not documented. *Do not* attempt to use these options—they may not work reliably outside the development environment.

- 3 Type **g** and press <Return> to select the GSP card.

The General Signal Processor (GSP) menu shown below appears:

General Signal Processor (GSP)

```
Q > Quit
1 > Test ALL 3 GSPs once (use only when GSPs are out of service)
2 > Interactive GSP Test (use only when GSPs are out of service)
3 > Modify frequency of test reports and SM test adrs limits
4 > Set RX and TX gains for card [RX: 0.00 dB TX: 0.00 dB]
5 > Copy memory from one DSP to another
6 > DSP Firmware release, 68K/DSP address mapping
7 > Compare Program Memories of 2 DSPs
8 > DSP Program Memory Editor
9 > GSP Signaling Interface monitor
Your choice : 9
```

- 4 Type 9 and press <Return> to select the GSP Signaling Interface Monitor (SIM).

The Display Format menu shown below appears which allows you to choose different SIM presentation formats (which are described in the subsequent sections of this chapter).

DISPLAY FORMAT

```
0 > Help
1 > Full Screen Display
2 > Scrolling Display for Printer
3 > High Speed Record (no display)
Your choice:
```

Using the signaling interface monitor (SIM)

The SIM offers two different display formats for monitoring the signaling interface:

- Full Screen Display
- Scrolling Printer Display

The High Speed Record (no display) menu option records states for later playback using one of the other two display modes.

Channel numbering

Channels are identified in the displays by a combination of the DSP number (0 to 7) within the node, and the channel number (0 or 1) associated with a particular DSP. In order to convert the normal channel number that is displayed using the DSP Status menu in the normal MMI, refer to Table 33-1.

Note: The Channel number shown under the DSP Port Status Menu assumes that none of the ports are configured as multimedia ports.

Multimedia ports will have the incoming line connected to Port 1 of the DSP, which corresponds to SIM Ch. No. 0.

Table 33-1
DSP Port Status Menu to Signaling Interface Monitor

C-D-P	Channel	DSP No.	Ch. No.
3-1-1	1	0	0
3-1-2	2	0	1
3-2-1	3	1	0
3-2-2	4	1	1
4-1-1	5	2	0
4-1-2	6	2	1
4-2-1	7	3	0
4-2-2	8	3	1
5-1-1	9	4	0
5-1-2	10	4	1
5-2-1	11	5	0
5-2-2	12	5	1

Status Event History Buffer

While the SIM is in one of its display modes, it stores the last 300 “events” in a circular buffer in the 68K card’s memory. An event is a change of state for any of the K1, K2, or K3 relays in the node, or any line status change for any of the lines connected to the node.

Each event is stored with a time stamp which consists of a number of 10 millisecond intervals which are referred to as “ticks.” The time that has elapsed between two events can be determined by the difference in the value of their time stamps. This difference can be converted to seconds by dividing by 100 (for example, 250 ticks = 2.5 seconds).

Each element in the circular buffer that is used to store the events is identified by an “index” number. This index number can be used to jump to a specific point in the circular buffer (if desired) when status events are being replayed.

The lowest address in the circular buffer corresponds to an index of 0 and the highest address in the buffer corresponds to an index of 299. If fewer than 300 events have occurred when the SIM display is halted, the oldest event will have an index of 0 and the most recent event will have an index equal to the number of events that have occurred.

If more than 300 events occur before the SIM display is halted, any new event will overwrite the oldest event in the buffer. (for example, the 301st event will overwrite the data at index 0, the 302nd event will overwrite the data at index 1, and so on). When the SIM display is finally halted, the oldest event in the buffer will have an index of one higher than the most recent event in the buffer. Therefore, if the index for the most recent event is 158, the index of the oldest event in the buffer will be 159.

Full Screen Display

The Full Screen Display is useful for monitoring channel status while waiting for a specific event to occur. It provides a table of K1, K2, and K3 relay states, Tip and Ring status, and line type switch settings which are updated whenever something changes. This table is called the Full Screen Display. To make the Full Screen Display easier to read, a highlighted rectangle is used to indicate a value of 0, and a value of 1 remains dark.

Procedure 33-2

Using the Full Screen Display

Starting point: Display Format menu

- 1 Select **1** from the Display Format menu to access the Full Screen Display.

A Full Screen Display such as the one shown below appears. The TYPE field of the table refers to the Line Type configuration DIP switch setting for the corresponding channel (L = loop start, G = ground start).

(hit any key to stop) ☐ = 0

	DSP 0		DSP 1		DSP 2		DSP 3	
CHAN	0	1	0	1	0	1	0	1
K1=								
K2=								
K3=								
TIP								
RING								
TYPE	L	L	L	L	L	L	G	

The screen shown above has the following meaning:

- **DSP 0, ch 0** is on-hook and connected to a loop start line.
- **DSP 0, ch 1** is on-hook and is connected to a loop start line with an in coming call (20 Hz ringing).
- **DSP 1, ch 0** is off-hook and is connected to a loop start line.

- **DSP 1, ch 1** is executing a flash-hook (K1 goes to 1 for 300 milliseconds).
 - **DSP 2, ch 0** is off-hook and is connected to a loop start line.
 - **DSP 2, ch 1** is on-hook.
 - **DSP 3** is an idle, on-hook multimedia port connected to a ground start line.
- 2 Press any key on the terminal to stop displaying and recording the signaling interface status.

This freezes the displayed status, and displays new options at the bottom of the screen as shown below:

(hit any key to stop) □ = 0

	DSP 0		DSP 1		DSP 2		DSP 3	
CHAN	0	1	0	1	0	1	0	1
K1=								
K2=								
K3=								
TIP								
RING								
TYPE	L	L	L	L	L	L	G	

Stopped at index = 169
< M=menu, F=fast forward, R=rewind, P=play, S=->start Q=quit J=jump>

The list of options presented at the bottom of the screen is referred to as the Replay Menu, and is described later in this chapter. It allows you to replay up to the last 300 events that have been displayed using either the Full Screen Display mode or the Scrolling Printer Display mode. This is useful when an event has occurred which you wish to review for further analysis or to print out for a permanent record.

Scrolling display for printer

The Scrolling Display is useful for sending the channel status events to the printer in order to analyze the data in more detail or to generate a permanent record of the channel status events. It is normally used after an event of interest has been captured using either the Full Screen Display

mode or the High-Speed Record mode since it is harder to read on the terminal.

To print the scrolling display data

- 1 Press <Ctrl>-<PrintScreen>.
- 2 Press **p** to start the scrolling display.

Figure 33-1 shows a sample Scrolling Display.

The Scrolling Display uses tables similar to those used in the Full Screen Display to show the signaling interface state and line status. Values of 0 and 1 are used to indicate the relay states and Tip and Ring status.

To stop printing the scrolling display data

- 1 Press <Ctrl>-<PrintScreen> again.

A separate table is used for each change in relay state or line status in order to provide a snapshot of the signaling event. The time stamp and Status Event History Buffer index for the event is displayed following the table. A sequence of multiple events will thus be displayed as a sequence of multiple tables, each with a time stamp and index. The difference between the time stamps associated with two different events allows the elapsed time between the two events to be measured.

Note: To make the tables easier to read, values in the table that have changed are preceded by an asterisk (*).

Figure 33-1
Sample printout from Scrolling Display

				Explanation
CHAN	DSP 0	DSP 1		Initial state—ground start lines
K1=	0 1	0 1		
K2=	1	1		
K3=	0	0		
TIP	1	1		
RING	1	1		
TYPE	0	0		
(6476501 ticks) Index = 0				
CHAN	DSP 0	DSP 1		Incoming call—tip grounded
K1=	0 1	0 1		
K2=	1	1		
K3=	0	0		
TIP	1	1		
RING	*0	1		
TYPE	1	1		
(6476618 ticks) Index = 1				
CHAN	DSP 0	DSP 1		Incoming call—20 Hz ringing
K1=	0 1	0 1		
K2=	1	1		
K3=	0	0		
TIP	1	1		
RING	*0	1		
TYPE	0	1		
(6477161 ticks) Index = 3				
CHAN	DSP 0	DSP 1		Call answered
K1=	0 1	0 1		
K2=	1	1		
K3=	0	0		
TIP	*0	1		
RING	0	1		
TYPE	0	1		
(6477290 ticks) Index = 4				
CHAN	DSP 0	DSP 1		CO removes 20 Hz ringing 16 ticks (0.16s) later
K1=	0 1	0 1		
K2=	0	1		
K3=	0	0		
TIP	0	1		
RING	0	1		
TYPE	*1	1		
(6477306 ticks) Index = 5				
—continued—				

Figure 33-1
Sample printout from Scrolling Display (continued)

	DSP 0	DSP 1	
CHAN	0 1	0 1	
K1=	0	1	
K2=	0	0	
K3=	0	1	
TIP	*1	1	
RING	1	1	
TYPE	0	0	
(6478169 ticks) Index = 6			

Explanation

Far-end disconnect

	DSP 0	DSP 1	
CHAN	0 1	0 1	
K1=	*1	1	
K2=	0	0	
K3=	*1	1	
TIP	1	1	
RING	1	1	
TYPE	0	0	
(6478196 ticks) Index = 7			

Return to initial state

Stopped at index = 7

< M=menu, F=fast forward, R=rewind, P=play, S=>start Q=quit J=jump>

—end—

The list of options presented at the bottom of the printout (and your screen) is referred to as the Replay Menu, and is described later in this chapter.

High speed record (no display)

The High Speed Record mode is used to provide the most accurate event timing possible. This is achieved by not displaying signaling events as they occur, but simply storing them in the Status Event History Buffer for later playback using a different display mode. Timing accuracy is improved since the c25util program does not have to wait for the screen to be updated before it can poll the DSP for more status changes. Even so, the timing accuracy of the status events is still in the order of ± 10 milliseconds.

Replay menu

The Replay menu is displayed whenever the user halts any of the three main display modes by pressing a key on the terminal. The Replay menu options are

< M=menu, F=fast forward, R=rewind, P=play, S=->start Q=quit J=jump>

The following paragraphs describe each menu option.

Menu

The menu option of the replay menu allows the user to select a new display mode to look at the stored events.

Typing **M** causes the Display Format menu to be displayed:

```
DISPLAY FORMAT
0 > Help
1 > Full Screen Display
2 > Scrolling Display for Printer
Your choice:
```

Selecting either the Full Screen Display or the Scrolling Display causes the screen to be redrawn with the corresponding display (described above), and the Replay menu to be redisplayed at the bottom of the screen.

Fast forward

The events stored in the Status Event History Buffer are replayed using the current display mode from the current index in the history buffer until either the most recent event in the history buffer is reached or the user hits a key on the terminal keyboard to halt the display.

The time delay between events is removed so that the entire event sequence can be viewed quickly.

Rewind

The events stored in the Status Event History Buffer are replayed using the current display mode from the current index in the history buffer backwards until either the oldest event in the history buffer is reached or the user hits a

key to halt the display. The time delay between events is removed so that the entire event sequence can be viewed quickly.

Play

The Play option is the same as the Fast-forward option, except that the actual time delay between events is regenerated during the playback in order to replicate the actual timing.

Delays between events that are longer than 10 seconds are limited to 10 seconds and a message is displayed to inform the user when this is done.

This mode is generally used for the Full Screen Display mode, although it can also be used with the Scrolling Printer display mode if there are problems with the printer keeping up with the terminal.

Start

This causes the current index in the history buffer to be set to point to the oldest event in the history buffer.

Quit

This exits back to the main c25util menu.

Jump

This causes the current index in the history buffer to be set to a user specified index location.

Quitting the SIM and c25util

Follow procedure 33-3 to exit c25util.

Procedure 33-3

Quitting the SIM and c25util

Starting point: Full Screen Display or Scrolling Display for Printer

- 1 Press any key to display the Replay menu.

The Replay menu shown below is displayed at the bottom of the screen:

< M=menu, F=fast forward, R=rewind, P=play, S=->start Q=quit J=jump>

- 2 Press **q** and press <Return> to quit the Signal Interface Monitor.

You are returned to the GSP menu shown below:

General Signal Processor (GSP)

```
Q > Quit
1 > Test ALL 3 GSPs once (use only when GSPs are out of service)
2 > Interactive GSP Test (use only when GSPs are out of service)
3 > Modify frequency of test reports and SM test adrs limits
4 > Set RX and TX gains for card [RX: 0.00 dB TX: 0.00 dB]
5 > Copy memory from one DSP to another
6 > DSP Firmware release, 68K/DSP address mapping
7 > Compare Program Memories of 2 DSPs
8 > DSP Program Memory Editor
9 > GSP Signaling Interface monitor
Your choice : 9
```

- 3 Press **q** and press <Return> to exit c25util.

You are returned to the PUP level ">" prompt.

- 4 Type **pup** to exit the PUP level.

After several seconds the MMI will restart and you are returned to the Meridian Mail Login screen.

Chapter 34: ECS Registration Utility (ecs_util)

ECS Registration utility

This utility allows the registration and deregistration of an emergency customer solution (ECS) on Meridian Mail. The following two functions are provided with this utility:

- The ability to scan loaded software on the system and report on all online ECSs.
- The ability to maintain a log file of ECS activity on the system disk-volume.

Note: The ECS log file will be part of the VS1 text volume under the “:BOOT100:FIELDSUPPORT” directory. Therefore, it will be saved during full and partial backups, and can be manipulated using *HX_PKG*.

This utility should be used to monitor ECSs installed at a site. This utility will not be an automated ECS installation or deinstallation tool and current procedures should be followed to install and activate ECSs. Once an ECS is installed or removed, the support engineer should run this utility to log the event to file.

Along with this utility a new command will be available through the system debugger (<Ctrl>–<BTB> and <NETHOST>) to list ECSs on a node.

Invoking the utility

The utility can be invoked either from the ETAS level menu or from any cli shell if you are tight on resources. Use Procedure 34-1 to invoke the ECS Registration Utility from the ETAS level menu; otherwise, use Procedure 34-2 to invoke the ECS Registration Utility from the cli shell.

34-2 ECS registration utility (ecs_util)

Procedure 34-1

Invoking the ECS Registration utility (from the ETAS menu)

Starting point: ETAS main menu

- 1 Select the **ci** menu item.
- 2 Switch to the CI window.
- 3 Type **ecsmenu**.

This will invoke the ECS Registration Utility menu.

Procedure 34-2

Invoking the ECS Registration utility (from the cli Shell)

Starting point: Any cli shell

- 1 Type **load ecs_pkg**.
- 2 Type **ecsmenu**.

This will invoke the ECS Registration Utility menu.

If you load the utility from the cli shell, issue the **unload ecs_pkg** command when you are done.

The ECS Registration Utility menu

The ECS Registration Utility menu has five choices.

- List On-line ECS (all nodes)
- Register ECS to Log File
- Write ECS Log File to terminal
- Write ECS Log File to printer
- Exit

List On-line ECS (all nodes)

The List On-line ECS option will search the system software (in RAM) for all active ECSs (that is, all ECSs that were installed and activated using the Product Support ECS installation procedure) and list them to screen.

An example of the use of the option is shown below.

Node	Loc	Description
1	3	MM11070: VCM: Larger table sizes
3	5	MM11083: VSS: 6 Days before answering call

Register ECS to Log File

The Register ECS option will allow the user to enter information about the ECS that was installed or is to be removed. Upon downloading the appropriate ECS files to the system and copying them to the appropriate directories on the system volume, the user will select this option and enter the ECS information as prompted.

Procedure 34-3 Registering an ECS

Starting point: Meridian Mail ECS Registration menu

- 1 Select the Register ECS option from the menu.
- 2 Enter the ECS number (for example, MM11088).
- 3 Enter *InService* as the ECS status.
- 4 Enter the CSR number associated with the problem.
The following two steps (5 and 6) are optional.
- 5 Enter the PRS number associated with the problem.
- 6 Enter the release to which this applies.
- 7 Enter the installer's name.
- 8 Enter the activation date (if different from the current date) in the format DD/MM/YY.
The following step (9) is optional.
- 9 Enter any comments.

Procedure 34-4 Deregistering an ECS

Starting point: Meridian Mail ECS Registration menu

- 1 Select the Register ECS option from the menu.
- 2 Enter the ECS number (for example, MM11088).
- 3 Enter *OutOfService* as the ECS status.
- 4 Enter the CSR number associated with the problem.
The following two steps (5 and 6) are optional.

34-4 ECS registration utility (ecs_util)

- 5 Enter PRS number associated with the problem.
- 6 Enter the release to which this applies.
- 7 Enter the installer's name.
- 8 Enter the activation date (if different from the current date) in the format DD/MM/YY.

The following step (9) is optional.

- 9 Enter any comments.

Write ECS Log File to terminal

The List ECS Logs option will print the contents of the ECS log file to the screen.

An example of the output is shown below.

ECS	Number	MM11027
	Status	InService
	Date	99 02 14
	CSR	9969668
	PRS	BV12345
	Release #	12.13
	Installer	Susan Smith
	Comments	This is a sample ECS registration

Write ECS Log File to printer

The Print ECS Logs option will print the contents of the ECS log file to the system printer.

Exit

The Exit option will exit this utility. Remember to issue the **quit** command if you have invoked the utility from the ETAS level menu or the **unload ecs_pkg** command if you have invoked the utility from a cli shell.

ECS Registration Utility limitations

The ECS Registration Utility is not an automated ECS installation or deinstallation tool. Standard ECS installation procedures should be followed on all platforms to install or remove ECSs.

Any ECS that involves changes in the following components will not be listed with the *List On-line ECS* option:

- DSP files
- T1 firmware

- prompt and language files
- hardware

Any ECS that involves changes in these components will have to be registered in the log file and can be listed with the List ECS Logs options.

If, for any reason, the ECS log file becomes corrupted, it will have to be removed using the ***HX_PKG*** utility. The utility will create a new log file with no entries.

A maximum of 25 ECSs can be registered on a system at any one time.

34-6 ECS registration utility (ecs_util)

Appendix A: Remote viewing of bootup diagnostics on the MSM

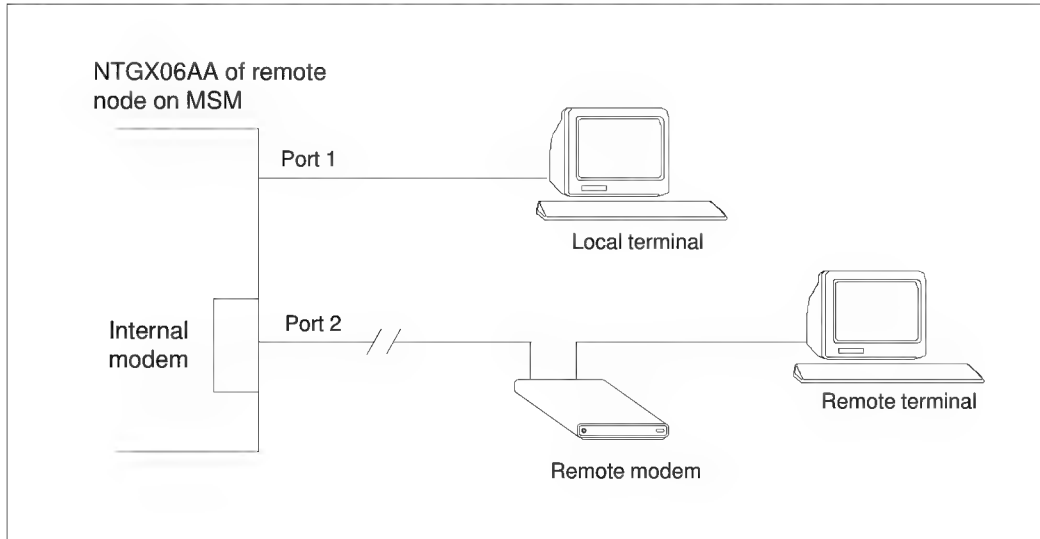
Note: This section only applies to Meridian Mail systems on the MSM platform.

This section provides the procedures to be used by maintenance personnel for remotely logging into the message service module (MSM) and viewing the messages generated while bootrom diagnostics are being executed on the signal processing nodes (SPN). Procedure 35-1 should be used for nodes with the NTGX06AA 68K Transition module (TM), while Procedure 35-2 covers the NTGX06AB TM.

Follow the standard modem setup and remote access procedures described in Chapter 10, "Remote view boot-up diagnostics," of the *Trouble-Locating and Alarm-Clearing Procedures* manual (NTP 557-7001-503) to view the bootrom messages for multiserver processor (MSP) nodes.

Note: The bootup messages on Telephony Interface Node (TIFN) cannot be viewed using these procedures since the internal modems are reset at node boot up and currently there is no mechanism to reenale them during the bootrom execution.

Figure 35-1 Setup for remote access on NTGX06AA on MSM



Procedure 35-1

Remote viewing on the NTGX06AA 68K Transition Module (TM)

- 1 Set up the local terminal, remote modem, and remote terminal as shown in Figure 35-1.
- 2 From the Node Status screen of the MMI, disable the remote node you wish to reboot. This will result in a reboot of the node.
- 3 At the terminal connected to port 1 of the remote node, hit the <Break> key several times as soon as the bootrom starts sending messages to the screen.

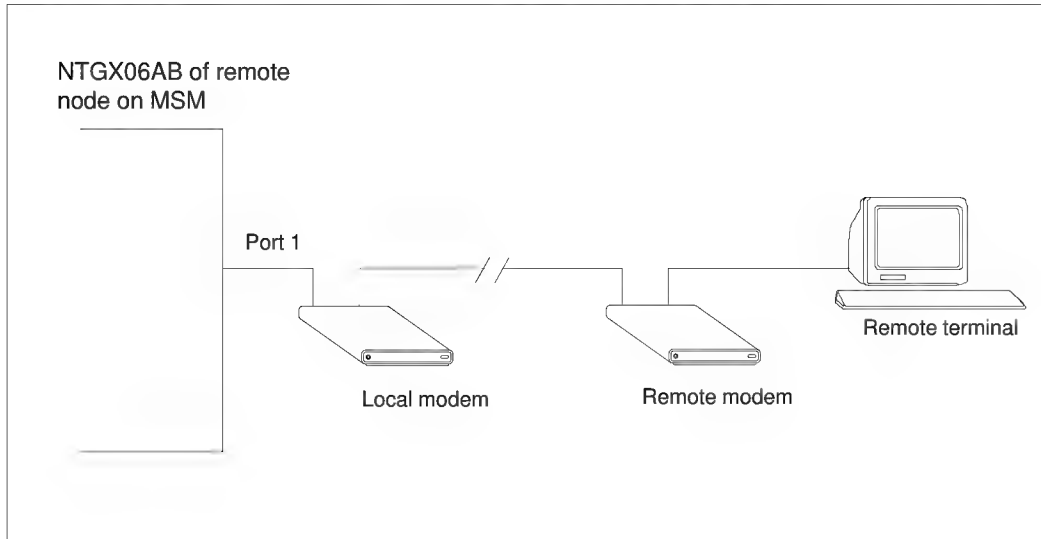
The “” prompt should appear.*

- 4 Type **XM** to enable the internal modem.
- 5 Type **AA 1** to set the internal modem to the auto answer mode.
- 6 Dial into the MSM from the remote modem by using the modem command **ATDT nnnn** (where nnnn is the phone number) on the remote terminal.

The call should be connected.

- 7 From the remote end type **BT**. This will result in a continuation of the boot process and therefore the diagnostics.

The bootup messages will be visible on the remote terminal.

Figure 35-2 Setup for remote access on NTGX06AB TM on MSM**Procedure 35-2**
Remote viewing on the NTGX06AB TM

- 1 Set up the local and remote modems as shown in Figure 35-2.
- 2 Enable the DTR option on the local modem.
- 3 From the remote modem, call the local modem by entering the modem command **ATDT nnnn** (where nnnn is the phone number) on the remote terminal and wait for the connection.
- 4 From the Node Status screen of the MMI, disable the remote node you wish to reboot.
This will result in a reboot of this node.
- 5 All of the boot-up messages will be received at the remote terminal.

Appendix B: Rebuilding system files

If certain system files become damaged, then essential parts of Meridian Mail do not function. Meridian Mail release 12 addresses the rebuilding of three types of files

- the system profile
- customer profiles
- the organization directory (DR)

The system and customer profiles can be rebuilt using existing utilities. The rebuild is entirely a manual process. All relevant data has to be reentered, there is no capability to reconstruct these profiles from data elsewhere on the system.

To rebuild the system and customer profiles use the relevant utilities

- `co_install`
- `ad_util`
- `md`
- `md_dr`

Note: You can run the `co_install` command by starting `#tape:mmtape1:ci:code` and then typing `co_install`.

System profile

Procedure 36-1

Restoring the system profile

- 1 Start AD_UTIL.
- 2 Go to AD_UTIL window.
- 3 Type in **addsysprof <vol number>**.
where <vol number> = 1 to create /1/cust/SysProf.
- 4 Insert installation tape into the tape drive.
- 5 Start the tape server. Start a CI window.
- 6 Type **ft** at the CI window.
- 7 Type **fork :#tape:mmtape1:ci.code**.
The command is not case sensitive.
- 8 Go to the CI.CODE window.
- 9 Type **coinstall**.
You are prompted "Finished updating all accessible customer profiles."

Note: However, if there are no customer profiles, then none will be updated. This is not a problem because customer profiles created later will inherit features from the now-updated system profile.
- 10 Type **installlang**.
This will install all the required language records in the system profile, based on the system record.
- 11 Type **installswitch**.
This will install all the required switch records in the system profile based on the system record.

Customer profile

A customer profile can be added through the MMI or by using Ad_util. However, if DR entries exist for any customer profiles, even though the profiles do not exist in the /1/cust cabinet, they cannot be added until the DR entries are removed.

Procedure 36-2 Restoring a customer profile

- 1 Do DR entries exist for the customer profile?
 - a. If yes, go to step 9.
 - b. If no, start **md_dr**.
- 2 Go to the MD_DR window.
- 3 Type **dr_open**.
- 4 Type **drsimplfind type Broadcast**.
This command finds the first and subsequent Broadcast entries in domain "1".
- 5 Do you have any Broadcast entries to be deleted?
 - a. If yes, type **drdelentry** (after the desired entry.)
 - b. If no, continue.
- 6 Type **drdomain system**.
This will take you to the system domain.
- 7 Type **drsimplfind type OrgEntry**.
This command finds the first and subsequent OrgEntry entries in the system domain.
- 8 Do you have any OrgEntry entries to be deleted?
 - a. If yes, type **drdelentry** (after the desired entry.)
 - b. If no, continue.
- 9 If all OrgEntry and Broadcast entries are deleted from any customer to be readded, then go to the Ad_util window.
- 10 Type **addcust prof <customer number> <voice messaging type> <user community>**.
Where the appropriate customer number, voice messaging type (VMUIF or MMUI), and user community (Private, Residential, Hospitality) are specified.

Note: This step can also be done from the MMI. It is not required that Ad_util be used to add customer profiles.

- 11 Go to the MMI. In the General Options menu screen for the newly readed customer profiles, enable and disable features as desired for each customer.

DR rebuild utility

The remainder of this appendix concentrates on the DR rebuild utility. The DR rebuild utility attempts to recover lost DR data that is kept elsewhere in the system. All entries are not recovered but the essential entries for user voice messaging, voice menus, announcements, fax items, voice forms, thru-dial definitions, and time-of-day controllers are recoverable.

The DR rebuild utility is an enhancement to the existing online DR reload available from the package loaded into md_dr. See Chapter 9, “Corporate Directory Tool (md_dr),” for more information on the utility. Additional capability is added to try to reconstruct DR entries from data files kept elsewhere in the system. In most cases, the DR can be successfully rebuilt.

Procedure 36-3 Rebuilding system files

- 1 Invoke the DR rebuild utility by forking md_dr from the ETAS menu.
- 2 Load drfix_pkg.
- 3 Enter the following command to instruct the utility to also rebuild the directory:

dronlinereload +r

This command scans the users' cabinets, voice services cabinets, system profiles, and customer profiles in turn. It attempts to reconstruct missing DR entries from these files on the system.

- 4 Enter the following command to install the rebuilt directory and remove the old one:

drswitchdirs

- 5 Read any missing VSDNs, services, remote entry users, directory entry users, and system distribution lists. If you have a bulk provisioning tape, you can use bulk provisioning to read services, VSDNs, and remote users.

Note: We recommend that you follow the remaining steps after the DR has been rebuilt and installed.

- 6 Run the is_patch commands to ensure that the DR and user cabinets are in synch.
fixcabtousers
fixuserstocab
- 7 Run the vsp_util commands to ensure that the DR and voice service cabinets are in synch.
synccabinet
patchdr

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Meridian Mail

ETAS Utilities

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are trademarks of Northern Telecom.

Publication number: 555-7001-260
Product release: 12
Document release: Standard 1.0
Date: January 1998

Printed in the United States of America

NORTEL
NORTHERN TELECOM